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M. Laura Angelini
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Simulation for Participatory Education

Virtual Exchange and Worldwide Collaboration

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Foreword

Educating, in the words of Gabriel Celaya, a renowned Spanish poet, is like clamping a motor to a little boat, which requires measuring, thinking and balancing to get it all started. On the expanding vessel's way to faraway lands, it will call at distant ports to load words, knowledge and experience, assimilated by civilisation over time from the prehistoric playing with spears to the playing and working in the virtual context of today. Learning and the whole journey through education will configure a person's life.

Humankind at birth is plunged into a culture. Huizinga argues that, instead of homo sapiens, the term for humankind should be *homo ludens* (man that plays), as play is older than culture and the act of playing has become inherent to human culture. Culture is initially played and developed in the ways and with the spirit of a game.

Thinkers have even conceived the world as play, as the poet Yeats interpreted Plato's idea that "nature is but a spume that plays upon a ghostly paradigm of things". Playing with the endless variables of that "paradigm of things" with today's dynamic, concurrent capacity to simulate reality broadens the horizon of education. Thus, simulation and virtual exchanges are now a gateway for a global intercultural exchange from an intracultural setting, as the learning environment heightens first intracultural awareness in order to improve the ability for intercultural communication.

In the dichotomy simulation and virtual exchange, simulation encourages the acquisition of real and applied knowledge, whilst virtual exchange offers a diversity that facilitates the effective dissemination of knowledge. Knowledge thus gains greater potential by collecting the legacy of the local perspective and thrusts the local into the global culture. It is at this moment when a collaborative approach to learning takes place. The combination of simulation and virtual exchange generates a learning community context that draws on different local cultures, which leave the imprint of their identities on knowledge.

Virtual learning communities can spawn cognitive reactions similar to face-to-face learning communities. The key is the scenario, which must be fitting and well-executed. Our experience allows us to assert that simulation in virtual exchange is a binomial that meshes well and that it spurs the propagation of specific knowledge and transversal competences.

Education, simulation and virtual exchange have a characteristic in common. All three share the element of innovation. Education subsists on constantly innovating knowledge with new input; it sets in motion changes that create and introduce new input. Simulation brings to the educational context in which it is used active and engaging reality. Virtual exchange permits educational programmes supported by technology in an environment of cultural diversity. In this trinomial, specific knowledge is unveiled and transversality is cultivated. In this sense, innovation refers to a learner's need to apply individual, interpersonal and networking skills or behaviours as defined in the INCODE Barometer, which uses a multidimensional hierarchy to measure learner innovation achievement. "Simulation for Participatory Education: Virtual Exchange and Collaboration Worldwide" has a triple objective: To give an overview of the wide spectrum of disciplines and contexts in which simulation can be used; to illustrate the extent of the impact on learning that the integration of simulation and virtual exchange has in teachers/facilitators, teachers in training, teachers in service or participants in general; and to explore how learning is theorised in the simulation literature.

The importance of this book resides in the attempt to present a synthesis and evaluation of current evidence available in the field of simulation research. Despite the increasing popularity of simulation amongst practitioners, in teacher education, there is scarce research confirmation of the nature and quality of the processes and their consequences for learning. This state-of-the-art volume presents a broad range of the different, often thorny, issues related to the use of simulation in educational contexts, such as how to justify use based on academic theory, organise and pace, facilitate, debrief and evaluate effects on learning. Virtual exchange is seen here as a means to enhance simulation practice, which should be an integral component in the design of holistic practitioner development.

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References

Celaya, G. (1982) *Educar*. https://lapoesiatoda.wordpress.com/2017/12/22/educar-de-gabriel-celaya/ (Authorship attributed).

Huizinga, J. (2012). *Homo Ludens*. Trad. Imaz, E. Madrid: Alianza Editorial.

Watts, F, García-Carbonell, A. & Andreu-Andrés, M. (2013) *Innovation Competencies Development*. INCODE Barometer and User Guide. http://incode-eu.eu/fileadmin/_migrated/content_uploads/ICB-Barometer.pdf

Yeats, W. B. (1928) Among School Children, VI. In Sexton, J. (2014) English Literature: Victorians and Moderns, p. 415. *Open Research Library*, ID: 10670/1.57bw3j

Who is This Book For?

This book aims to be an essential reference guide for those directly involved in simulation in education in different fields of study, mainly high-school teachers, academics of different areas, but more specifically, teacher trainers in schools of education. The use of simulation has spread since the turn of the millennium, now becoming a popular approach to teacher development worldwide. However, whilst the academic and professional literature surrounding simulation has rapidly expanded, there has been very limited large-scale synthesis of the emerging evidence in teacher training. This is particularly true of the main focus of simulation, its potential impact on student learning and dialogical practice. Therefore, at this point in the development of the simulation field, we wish to undertake a collection of different visions which asks the following questions:

> What fields of study can be benefitted by the use of simulation? How is learning theorised in the simulation literature?
> To what extent does the integration of simulation and virtual exchange report impact the learning of (a) teachers/facilitators and (b) pre-service teachers and in-service teachers/participants?

The book arranges research based on Simulation Essentials, Simulation-driven Proposals, Simulation and Virtual Exchange, and Simulation Samples. The aim is also to provide readers with evidence and research that account for users' experiences and perceptions across various disciplines that use simulation as a teaching/learning educational model.

Furthermore, the significance of this book relates to the synthesis and evaluation of the current evidence within the field of simulation research. Whilst the approach is becoming increasingly popular amongst practitioners, there is little synthesised research evidence concerning the nature and quality of processes and impacts on learning in higher education, especially in teacher training. This project will produce a long overdue "state-of-the-art" synthesis that captures evidence of

- simulation overview and successful implementation;
- the importance of debriefing and good facilitation;
- simulation-driven proposals and impact on students' learning;
- current practices integrating virtual exchange.

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Part I
Simulation Essentials

A Comprehensive View of Simulation

1

M. Laura Angelini and Marieke de Wijse-van Heeswijk

Overview

We will start off this chapter by tracing the history of simulation and reflecting on its use in educational contexts, mainly in higher education. Unfortunately, the literature in the area of simulation and training within the field of teacher education is limited (Clarke, Clarke Technology, Pedagogy and Education 22:121–131, 2013; Vlachopoulos & Makri, Vlachopoulos and Makri International Journal of Educational Technology in Higher Education 14:1–33, 2017). However, literature in the area of simulation and training does exist in professional training in several disciplines. We describe some of the institutions using simulation and serious games and the leading simulation associations worldwide.

Keywords

Simulation · Serious games · Higher education · Professional training

Learning Objectives

Readers of this chapter will explore

- the concept of simulation;
- relevant simulation applications in different disciplines;
- simulation effect across disciplines;
- institutions using simulation and the leading simulation associations worldwide.

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1.1 Simulation

Let us first define simulation. A simulation refers to an activity in which participants are assigned duties and are given enough key information about the problem to carry out these duties without play-acting or inventing key facts (Jones, 2013). A simulation is based on a representation of a system, with key information to carry out tasks, debate, negotiate from different points of view, and seek a solution to a specific problem (Klabbers, 2009).

According to Crookall and Thorngate (2009), simulations can be classified as follows:

- Knowledge-to-Action (K-A) events, which are designed, run, and debriefed primarily to enable or encourage participants to apply previous knowledge to some practical situation.
- Action-to-Knowledge (A-K) events, which are designed, run, and debriefed primarily to enable or encourage participants to generate understanding, learn new skills, and gain new knowledge from a concrete experience.
- Integrating-Action-Knowledge (I-A-K) events, which are designed, run, and debriefed primarily to enable or encourage participants to make connections between their actions and the related knowledge.

This categorization of simulation draws an analogy with what is expected in teacher education: interaction to apply previous knowledge; development of a broader understanding of educational issues and the gain of new knowledge; and the integration of multiple teaching goals in a single process by connecting actions to knowledge. Thus, simulations create a natural context where pre-service teachers become acquainted with a variety of educational realities and problems; they interact, debate, and make proposals (García-Carbonell et al., 2014; Angelini, 2021). At this point, we can argue about the transformational effect of simulation. Transformative teaching/learning allows educators to inspire students to challenge their preconceived beliefs, assumptions, and values through dialogic practices in the simulation (Parker & Myrick, 2010). So the simulation becomes an immersive teaching/learning platform (Erlam et al., 2017) which should carefully be built on the principles of behaviorism, constructivism, and cognitivism (see Chap. 2 "A Roadmap to Simulation in Education"). Figure 1.1 highlights the different skills potentially developed by learning through simulation which are collected in specialized literature about teaching and learning methodologies.

Thiagarajan (2003) classifies simulation into "high-fidelity" and "low-fidelity". High-fidelity simulations (HFSs) give participants a true-to-life experience, in which they can discover underlying principles and develop specific and soft skills. They have traditionally represented replicas of on-the-job tasks and thus they have been categorized as scoring high on fidelity. In turn, "low-fidelity" simulations are simplified models that only include a few chosen factors from reality (Thiagarajan, 2003; Massoth et al., 2019). These are especially used to uncover underlying

Fig. 1.1 Specific and transversal skills through simulation (Angelini, 2021)

principles and practice procedural skills. These are not really new inventions; in fact, they existed prior to World War II. Motowidlo et al. (1990) coined them "low-fidelity simulations" because participants had to act out in work-like scenarios solving a problem by choosing an alternative outcome from a list of predetermined responses (Lievens & Patterson, 2011 in Angelini, 2021).

1.1.1 Tracing Simulation

Historically, military games have always been predominant. In the article "Historical Roots and New Fruits of Gaming and Simulation", Willy Kriz (2017) clearly describes the transition of warlike games into simulations. Starting with GO, from China about 400 BC, CHATURANGA and CHESS, from India about 500 AB, subsequent games appeared as the NEWLY INVENTED GREAT KING'S GAME by Christoph Weickmann in 1644 and the BRUNSWICK WARGAME in 1780 by Johann Christian Ludwig Hellwig. It is precisely this latter, which was originally entitled "Attempt of a tactical game based on chess and played by two or more persons", that turned out to be a war "simulation", simple in terms of rules at the beginning but evolved into complex simulations to train officers to build attack and defence strategies (Angelini, 2012).

It was Hellwig's initiative to use the BRUNSWICK WARGAME for his teaching and training of military officers of the Prussian Army (Kriz, 2017). The simulation was aimed at developing strategic and tactical skills and, at the same time, enhancing military operations in a more authentic and realistic way. Also, more sophisticated business war simulations were designed as, for example, the American Management Association (AMA) TOP MANAGEMENT DECISION

SIMULATION. It became the first computer simulation in 1956 (Kriz, 2017). In 1958, the first business board game appeared under the name BUSINESS MANAGEMENT GAME. Designed by Gerhard Andlinger and Jay Greene, the game simulated several companies competing on the market (Andlinger, 1958). More recently, simulations have been adopted by different fields in an attempt to develop skills such as foreign languages, cultural training, and future application areas (Michael & Chen, 2006).

In the case of politics, for instance, simulations are used to deal with crisis management, terrorist attacks, disease outbreaks, policy issues, city planning, and traffic control, among others (Duke & Geurts, 2004; Michael & Chen, 2006; Squire & Jenkins, 2003). By using simulation, it is guaranteed the practice of situations that are too dangerous, impossible, or too expensive if carried out in reality.

Corporations have also applied simulation to train workers. Digital simulations and serious games are common as there is a great number of employees who are familiar with them and whose interest is easily caught by interacting with them. Michael and Chen (2006) identify some skills trained by simulation and serious games: teamwork and how to perform well within the department; job-specific skills or how to use specific software/hardware for the job, etc.; organization skills or how to organize resources and time, etc.

Simulation also offers many advantages for medical education. Fletcher (1995) identified several benefits such as the reproduction of complete clinical settings with no threats to patient safety. Also, through simulation, active learning occurs and knowledge is applied to specific patient situations. Errors can be corrected and discussed straightaway. Different responses and actions can be compared by the students-participants. In surgical training, for example, it has been proved that experience with simulation correlates with better performance surgeries such as laparoscopic or shoulder arthroscopy (Ahlberg et al., 2002; Cook et al., 2013; Fried et al., 1999; Goldstein et al., 2014; Gomoll et al., 2007; Keyser et al, 2000; Krishnan et al., 2017; Lorello et al., 2014; Mundell et al., 2013; Sroka et al., 2010).

In addition to these benefits, communication, teamwork, and delegation can be simulated. Thus, a mix of technical and non-technical experiences is offered. Harwayne-Gidansky et al. (2017) carried out a study about the effects of mannequin-based immersive simulation on medical education. They found that a scenario-based immersive simulation (with a structured debriefing) added to standard clinical educational methods notably improved the assimilation, retention of information, and proper application of medical knowledge and participants' decision-making.

1.2 Some Relevant Research on Simulation Effect Studies

A large number of studies address simulation from an immersive learning perspective (Beckem, 2012; Bogost, 2007; Chang et al., 2010; Deen, 2015; Ekker, 2000; Gegenfurtner et al., 2014; Harteveld, 2011; Klabbers, 2009; O'Flaherty &

Phillips, 2015; Polanyi & Sen, 2009; Wedig, 2010; Wiggins, 2012). Kolb's experiential learning cycle (see Chap. 4, Sect. 4.3.3. "On designing learning loops with pre-structured questions and stimuli") can be addressed as the main conceptual framework used for experiential learning in simulation (Kolb & Kolb, 2018). Experiential learning is considered a process through which knowledge is built by transforming the experience. Learners go through concrete experience, reflection, conceptualization, and experimentation. The cycle begins with the learners' involvement in a specific experience (simulation); then they reflect on the experience from different viewpoints (reflective observation). Through reflection, learners create generalizations and principles and draw conclusions (abstract conceptualization when explaining or thinking). The learners then use these principles and conclusions in subsequent decisions and actions (active experimentation such as applying or doing) that lead to new concrete experiences (Kolb & Kolb, 2018; Kolb et al., 2014). Other authors have been inspired by Kolb's learning cycle in their research on simulations. Table 1.1 offers a sample of studies chronologically organized that add value to how simulation games contribute to learning.

On balance, results indicate that simulations have a positive impact on learning goals. Most researchers agree on three main learning outcomes: cognitive, interactive, and affective. The authors provide enough evidence on the virtues of simulation for pedagogical purposes and such evidence also provides potential options and pathways for future research.

Table 1.1 Studies based on simulation games

Studies	Effects	Added value
Crookal and Oxford (1990)	Practical aspects of using simulation/gaming in language learning	Application of simulation/gaming to specific areas; computerized language learning simulations; theoretical aspects; sample simulations
Klabbers (2001, 2009)	Simulations learning and instructional resources	A springboard for interactive learning; develops expertise and tacit knowledge
Kriz (2003)	Simulations convert problem-oriented learning into purposeful action	Simulations favor change processes in educational organizations;
Ekker (2004)	Simulation invigorating learning	Simulation is a reality in itself
Levine (2004)	Telecollaborative exchanges and global simulations	Immersive, simulated environment; student-centered, task-based alternative to conventional curricula
Leigh and Spindler (2004)	Chaos theory as a framework for identifying skills and knowledge to anticipate and respond to the uncertainties	Understanding of chaos theory, coupled with skills to apply this knowledge to open simulations, enables educators to more quickly and accurately select and apply appropriate learning-centered interventions

(continued)

Table 1.1 (continued)

Studies	Effects	Added value
Halleck and Coll-García (2011)	Telecollaborative exchanges and global simulations	Web-based simulations affect the development of language abilities, critical thinking, and intercultural awareness
Alklind et al. (2012)	Simulations help improve the learning experience	A coaching framework: instructors-facilitators taking up a role as participants in the simulation
Burke and Mancuso (2012), They identified. They asserted that	Debriefing phase from a social cognitive theory, metacognition, and simulation Debriefing helps build students' self-efficacy and regulation of behavior	Core principles of intentionality, forethought, self-reactiveness, and self-reflectiveness in simulation environments
Rising (2009)	Simulation to learn languages	Greater exposure to the target language
Andreu-Andrés and García-Casas (2011)	Simulation to learn languages	More purposeful interaction, input more comprehensible for learners
Watts et al. (2011)	Simulation to learn languages	Affective filter lowered, anxiety reduced
Woodhouse (2011)	Simulation to learn languages	Sociocultural aspects related to communication in the target language, and greater powers of decision, persuasion, and assertiveness in communication
Michelson and Dupuy (2014)	Simulation to learn languages	Learners' awareness of language and other communication modes as social signifying practice, and their abilities to draw upon multiple Available Designs in making meaning
Reeve (2013)	Simulation to learn languages	Simulation to develop or reinforce theoretical understanding
Ranchhod et al. (2014)	Simulation to learn languages	Management experience and professional skills
Michelson and Dupuy (2014)	Simulation to learn languages	Simulations to boost students' awareness of the target language together with other communication codes
Kriz and Auchter (2016)	Overall increase in the participants' knowledge of business administration and business plan preparation skills	Significant gender-based differences identified related to entrepreneurial attitudes and motivation; participants initiating start-ups at a higher rate

(continued)

Table 1.1 (continued)

Studies	Effects	Added value
Angelini (2016)	Flipped learning instruction and simulation-based lessons to optimize class time by using and designing simulations with prospective secondary school teachers	Benefits of using simulations that are based on literary extracts with a substantial social component
Blyth (2018)	Simulation to learn languages	Web-based simulation as immersive technologies in foreign language education; what constitutes immersion—virtual or otherwise
Hamada et al. (2019)	Understanding of the state of the art of the simulation and gaming research field	Familiarizes readers with examples of simulation and state-of-the-art gaming in education, social problem solving, and experimental research; insights into handling simulation and gaming from clinical theory to problems faced by an individual
Angelini and Muñiz (2021)	Virtual exchange and simulation	Cross-cultural collaboration as the strongest benefit; critical awareness developed through comparing and contrasting their knowledge and experience
Naweed and Leigh (2021)	Examines instances where awareness of self and/or others influences how facilitators operate within simulations	Facilitators may experience greater anxiety than those managing non-facilitation settings Understanding the impacts of the gaze within and beyond A simulation may enable facilitators to prepare internally and perform externally. A conceptual framework is developed to assist facilitators reflect and identify applications
de Wijse-van Heeswijk (2021)	A three-layered framework of perspectives on ethical facilitation	Tangible perspectives with scientific foundations can be established and applied on the continuum of open and closed simulation games
McGue et al. (2021)	Simulation-based medical learning	Simulations used to develop understanding and empathy for psychiatric patients among trainees in medical schools
Schijven and Kikkawa (2022)	Ethical issues on game design	Cultural aspects and ethical issues

1.3 Where to Find Simulation and Training?

More and more institutions have been designing and applying simulation. Here we present some initiatives that may be of interest.

The School of Modeling, Simulation, and Training (SMST) at the University of Central Florida, U.S (https://www.ist.ucf.edu/), conducts cutting-edge human-centered simulation research and executes a world-class transdisciplinary graduate program to create leaders in modeling, simulation, and training. SMST houses a series of interdisciplinary graduate degree programs in modeling and simulation, designed primarily for students with backgrounds in STEM who wish to pursue careers in any number of fields, including academia, government, defence, entertainment, technology, service, and manufacturing.

The ICONS Project (2001) at the University of Maryland (https://www.icons.umd.edu/) creates simulations and scenario-driven exercises to advance participants' understanding of complex problems and strengthen their ability to make decisions, navigate crises, think strategically, and negotiate collaboratively. For many years, ICONS was part of the Government and Politics department and its Center for International Development and Conflict Management (CIDCM). In 2016, ICONS became an affiliated unit of the National Consortium for the Study of Terrorism and Responses to Terrorism (START), a research and education center based at the University of Maryland. While ICONS continues to maintain and pursue its mission to develop simulations on a wide range of topics and skill sets, the partnership with START has created further opportunities to collaborate on research and education.

The Simon Fraser University-carries out the project "Simulation and Advanced Gaming Environments for Learning" (SAGE) that focuses on health-related learning, aiming at learning: (a) how people learn through technology-based simulations; (b) which cognitive, human, and social factors contribute to making simulations engaging, motivating, and effective for learning; (c) how to integrate new technologies and theoretical knowledge of learning to create effective learning simulations in real-world settings (e.g., schools, hospitals, businesses, and communities); and (d) how to improve methods and tools for research and evaluation on learning with simulations. Another project is "HEALTHSIMNET" (part of a national network of research on simulations, games, and learning). The project models "the ontology of healthcare for HIV/AIDS sufferers and their networks of professional and lay support". The model forms the basis for the development of an interactive simulation game that will be used to review performance from individual and organizational perspectives. Yet another project is "Advanced Gaming Technology for Training Business Majors", which explores emerging technologies for business strategy gaming, and their implications on the pedagogy of business education. The project focuses on "active intelligent agents", which, if necessary, would allow removal of the human player from the simulation loop to speed up the game. Intelligent agents…offer such new opportunities as benchmarking the actions made by the learners during the game". The aim is to develop "new technical solutions to business strategy gaming and recommendations on bettering the pedagogy of gaming".

At the University of Birmingham, several continuous professional development courses and modules are offered. Academics with experience in education and simulation-based training and experienced clinicians based at the University Hospital Birmingham have designed programs that offer the opportunity to study the principles of experiential learning theory in healthcare simulation, the process of creating simulation scenarios, and the concepts underlying safe and effective debriefing. In addition to theoretical study, the course aims to promote the wider use of simulation modalities, non-technical skills, and human factors in healthcare teaching, learning, and practice.

In Stuttgart, Germany, the Zentrum for Management Simulation (ZMS) works on the ongoing optimization of simulation applied to the university and business contexts. The aim of ZMS research activities is to train today's students for tomorrow. They have several ongoing projects using simulation.

In the Netherlands, there are many organizations and educational institutes to choose from. Since the 70s, simulation and gaming have increased in popularity.

Applied university level

- Master Serious Gaming, NHL Stenden, Leeuwarden, Master deeltijd, 2 years.
- Post Bachelor Gamedidactiek, Hogeschool Utrecht, Utrecht, Post Bachelor, 3 months.
- Game Design, Game Art & Game Animation, SAE Institute, Amsterdam, 3 years, English only.
- Game Design, HKU Utrecht, Utrecht, Bachelor, 4 years.
- Creative Media and Game Technologies, Saxion, Enschede, Bachelor, 4 years, English only.
- Communication & Multimedia Design, HAN, Arnhem en Nijmegen, 4 years.
- Create a High End Video Game, HAN, Arnhem en Nijmegen, Exchange Course.
- CreativeMedia and Game Technologies, Hogeschool Rotterdam, Rotterdam, Bachelor, 4 years.
- Game Design, Hanzehogeschool Groningen, Groningen, Bachelor, 4 years, English only.
- HBO-ICT: Game Development, Hogeschool van Amsterdam, Amsterdam, 4 years.
- HBO-ICT: Game Design, Windesheim, Zwolle, Bachelor, 4 years.
- HBO-ICT: Game Design, Fontys, Eindhoven/Tilburg. MBO-level (middle-level education).

These institutions offer different learning tracks in which game design is a part of the course.

- Media- en Gamedeveloper, Mediacollege Amsterdam, Amsterdam, MBO-BOL, 4 years.
- Mediatechnologie, Grafisch Lyceum Rotterdam, Rotterdam.
- Software Developer, ROC Friese Poort, Drachten, MBO-4, 3 years.

- Game Developer, ROC A12, Ede, MBO-BOL, 3 years.
- Digital Design and Motion, Sint Lucas, Eindhoven, 4 years.

Online Courses

- MOOC Serious Gaming, Erasmus Universiteit Rotterdam, 10 h, online course op Coursera.
- GameSkool: Gaming in het Onderwijs.
- Game Designer LOI, HBO niveau, 4 months, self-study.
- Game Designer NHA, 4 months, self-study.

University level

- Creative Media en Game Technologies, Breda University of Applied Sciences, Breda, Bachelor, 3 years.
- Master Game Technology, Breda University of Applied Sciences, Breda, Master, 1 year.
- Game and media Technology, Universiteit Utrecht, Utrecht, Master, 2 years.

In Sweden, the KTH Royal Institute of Technology offers a meta-disciplinary game education course in which students acquire the knowledge and ability to assess what problems can be approached with a gaming simulation. They can understand the process of conducting game sessions; the different stages of game sessions; and the roles of facilitators, players, and note-takers in game sessions. They are able to draft the design specifications of a gaming simulation and may become contributing members of a game design team.

In Germany, the Centre for Simulation and Gaming at DHBW Stuttgart provides a selected list of companies that offer simulation games.

Summer schools and game jams worldwide

- The Global Game Jam® (GGJ)8 is the world's largest game jam event taking place around the world at physical locations. It is a non-profit volunteer-run event with a single goal: to bring together people all over the world to have a great time making innovative games. Global Game Jam is not a competition; it's a worldwide creative collaboration. Breda University of Applied Sciences has been providing a location for the Global Game Jam since 2012.

Simulation Associations Worldwide

Between the 1960s and 1970s, several gaming and simulation associations were founded (e.g., North American Simulation and Gaming Association—NASAGA, International Simulation and Gaming Association—ISAGA, Association for Business Simulation and Experiential Learning—ABSEL, Society for the

Advancement of Games and Simulations in Education and Training—SAGSET, etc.), and the journal Simulation and Gaming was established (Kriz, 2017).

• ABSEL	Association for Business Simulation and Experiential Learning
• DiGRA	Digital Games Research Association
• INDSAGA	Indian Simulation and Gaming Association
• ISAGA	International Simulation and Gaming Association
• JASAG	Japanese Association of Simulation and Gaming
• NASAGA	North American Simulation and Gaming Association
• SAGANET	Simulation and Gaming Association—The Netherlands
• SAGSAGSwiss	Austrian-German Simulation and Gaming Association
• SIETAR-USA	Society for Intercultural Education, Training, and Research—USA
• SSAGSg	Society of Simulation and Gaming of Singapore
• SSSG	Social Simulation and Serious Games
• ThaiSim	Thai Simulation and Learning Association—Thai SALA

The establishment of gaming and simulation associations shows two more important points. First, it is important to notice that they are not only communities of experts who design and use games and simulations for interactive learning. It was always another main goal—also of the journal—to support and pioneer game and simulation-based research in order to build and test theories in various scientific domains. Second, we should be aware of even older roots of gaming and simulation in the tradition of war games (even if we may oppose the purpose of these games). The North American Simulation and Gaming Association for example dates back to 1962. Originally, this association was founded as "East Coast War Games Council" and only later changed the name to express that the association had shifted toward other forms of gaming (including, e.g., business and economic gaming).

1.4 Summary

This chapter puts forward the diversity in applications of simulation and identifies three main learning outcomes from the use of simulation in education: cognitive, interactive, and affective. We find that simulation is less widespread in teacher education than in other areas such as engineering, nursing, or medicine, to mention some. We have also identified some of the institutions using simulation and the leading simulation associations worldwide. We hope that by initiating your journey through this book, you find motivation, ideas, and resources to help you apply simulation in your own professional area.

References

Ahlberg, G., Heikkinen, T., Iselius, L., Leijonmarck, C. E., Rutqvist, J., & Arvidsson, D. (2002). Does training in a virtual reality simulator improve surgical performance? *Surgical Endoscopy and Other Interventional Techniques, 16*(1), 126–129.

Alklind Taylor, A., Backlund, P., & Niklasson, L. (2012). The coaching cycle: a coaching-by-gaming approach in serious games. *Simulation & Gaming, 43*(5), 648–672.

Andlinger, G. R. (1958). Business games-play one. *Harvard Business Review, 36*(2), 115.

Andreu-Andrés, M. A., & García-Casas, M. (2011). Perceptions of gaming as experiential learning by engineering students. *International Journal of Engineering Education, 27*(4), 795–804.

Angelini, M. L. (2012). *La simulación y juego en el desarrollo de las destrezas de producción en lengua inglesa*. Doctoral dissertation, Universitat Politècnica de València.

Angelini, M. L. (2016). Integration of the pedagogical models "simulation" and "flipped classroom" in teacher instruction. *SAGE Open, 6*(1), 2158244016636430.

Angelini, M. L., & Muñiz, R. (2021). Simulation through virtual exchange in teacher training. *Edutec. Revista Electrónica De Tecnología Educativa, 75*, 65–89.

Angelini, M. L. (2021). *Learning through simulations: Ideas for educational practitioners*. Springer.

Beckem, J. M. (2012). Bringing life to learning: Immersive experiential learning simulations for online and blended courses. *Journal of Asynchronous Learning Networks, 16*(5), 61–70.

Blyth, C. (2018). Immersive technologies and language learning. *Foreign Language Annals, 51*(1), 225–232.

Bogost, I. (2007). *Persuasive games* (Vol. 5). MIT Press.

Burke, H., & Mancuso, L. (2012). Social cognitive theory, metacognition, and simulation learning in nursing education. *The Journal of Nursing Education, 51*(10), 543–548.

Chang, Y. C., Peng, H. Y., & Chao, H. C. (2010). Examining the effects of learning motivation and of course design in an instructional simulation game. *Interactive Learning Environments, 18*(4), 319–339.

Clarke, L. (2013). Virtual learning environments in teacher education: A journal, a journey. *Technology, Pedagogy and Education, 22*, 121–131.

Cook, D. A., Hamstra, S. J., Brydges, R., Zendejas, B., Szostek, J. H., Wang, A. T., & Hatala, R. (2013). Comparative effectiveness of instructional design features in simulation- based education: Systematic review and meta-analysis. *Medical Teacher, 35*(1), e867–e898.

Crookall, D., & Oxford, R. L. (Eds.). (1990). *Simulation, gaming, and language learning*. Newbury House.

Crookall, D., & Thorngate, W. (2009). Acting, knowing, learning, simulating gaming. *Simulation & Gaming, 40*(1), 8–26. https://doi.org/10.1177/1046878108330364

de Wijse-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332.

Deen, M. (2015). *GAME games autonomy motivation & education*. Lulu.com.

Duke, R. D., & Geurts, J. (2004). *Policy games for strategic management*. Rozenberg Publishers.

Ekker, K. (2000). Changes in attitude towards simulation-based distributed learning. Project DoCTA: *Design and use of Collaborative Telelearning Artefacts* (pp. 112–120). Oslo.

Ekker, K. (2004). User satisfaction and attitudes towards an internet-based simulation. *CELDA* (pp. 224–232).

Erlam, G. D., Smythe, L., & Clair, W. S. (2017). Simulation is not a pedagogy. *Open Journal of Nursing, 7*, 779–787.

Fletcher, J. L. (1995). AANA journal course: Update for nurse anesthetists–anesthesia simulation: A tool for learning and research. *AANA Journal, 63*(1), 61–67.

Fried, G. M., Derossis, A. M., Bothwell, J., & Sigman, H. H. (1999). Comparison of laparoscopic performance in vivo with performance measured in a laparoscopic simulator. *Surgical Endoscopy, 13*(11), 1077–1081.

García-Carbonell, A., Andreu-Andrés, M. A., & Watts, F. (2014). Simulation and gaming as the future's language of language learning and acquisition of professional competences. *Back to the Future of Gaming*, 214–227.

Gegenfurtner, A., Quesada-Pallarès, C., & Knogler, M. (2014). Digital simulation- based training: A meta-analysis. *British Journal of Educational Technology, 45*(6), 1097–1114.

Goldstein, J., Thomsen, M. F., & DeJong, A. (2014). In situ signatures of residual plasmaspheric plumes: Observations and simulation. *Journal of Geophysical Research: Space Physics, 119* (6), 4706–4722.

Gomoll, A. H., & O'toole, R. V., Czarnecki, J., & Warner, J. J. (2007). Surgical experience correlates with performance on a virtual reality simulator for shoulder arthroscopy. *The American Journal of Sports Medicine, 35*(6), 883–888.

Halleck, G., & Coll-García, J. (2011). Developing problem-solving and intercultural communication: An online simulation for engineering students. *Journal of Simulation/gaming for Learning and Development, 1*(1), 1–12.

Hamada, R., Soranastaporn, S., Kanegae, H., Dumrongrojwatthana, P., Chaisanit, S., Rizzi, P., & Dumblekar, V. (Eds.). (2019). *Neo-simulation and gaming toward active learning*. (Vol. 18). Springer Nature.

Harteveld, C. (2011). *Triadic game design: Balancing reality, meaning and play*. Springer Science & Business Media.

Harwayne-Gidansky, I., Bellis, J. M., McLaren, S. H., Critelli, K., Clark, S., Chen, Z., & Ching, K. (2017). Mannequin-based immersive simulation improves resident understanding of a clinical decision rule. *Simulation & Gaming, 48*(5), 657–669.

ICONS Project. https://www.icons.umd.edu/

Jones, K. (2013). *Simulations: A handbook for teachers and trainers*. London: Routledge.

Keyser, E. J., Derossis, A. M., Antoniuk, M., Sigman, H. H., & Fried, G. M. (2000). A simplified simulator for the training and evaluation of laparoscopic skills. *Surgical Endoscopy, 14*(2), 149–153.

Klabbers, J. H. (2001). The emerging field of simulation and gaming: Meanings of a retrospect. *Simulation & Gaming, 32*(4), 471–480.

Klabbers, J. H. (2009). *The magic circle: Principles of gaming and simulation*. Sense Publishers.

Kolb, A., & Kolb, D. (2018). Eight important things to know about the experiential learning cycle. *Australian Educational Leader, 40*(3), 8–14.

Kolb, A. Y., Kolb, D. A., Passarelli, A., & Sharma, G. (2014). On becoming an experiential educator: The educator role profile. *Simulation & Gaming, 45*(2), 204–234.

Krishnan, D. G., Keloth, A. V., & Ubedulla, S. (2017). Pros and cons of simulation in medical education: A review. *Education, 3*(6), 84–87.

Kriz, W. C. (2003). Creating effective learning environments and learning organizations through gaming simulation design. *Simulation & Gaming, 34*(4), 495–511.

Kriz, W. C., & Auchter, E. (2016). 10 years of evaluation research into gaming simulation for German entrepreneurship and a new study on its long-term effects. *Simulation & Gaming, 47* (2), 179–205.

Kriz, W. C. (2017). Types of gaming simulation applications. *Simulation & Gaming, 48*(1), 3–7. https://doi.org/10.1177/1046878117689860

Leigh, E., & Spindler, L. (2004). Simulations and games as chaordic learning contexts. *Simulation & Gaming, 35*(1), 53–69.

Levine, G. (2004). Global simulation: A student-centered, task-based format for intermediate foreign language courses. *Foreign Language Annals, 37*(1), 26–36.

Lievens, F., & Patterson, F. (2011). The validity and incremental validity of knowledge tests, low-fidelity simulations, and high-fidelity simulations for predicting job performance in advanced-level high-stakes selection. *Journal of Applied Psychology, 96*(5), 927.

Lorello, G. R., Cook, D. A., Johnson, R. L., & Brydges, R. (2014). Simulation-based training in anaesthesiology: A systematic review and meta-analysis. *British Journal of Anaesthesia, 112* (2), 231–245.

Massoth, C., Röder, H., Ohlenburg, H., Hessler, M., Zarbock, A., Pöpping, D. M., & Wenk, M. (2019). High-fidelity is not superior to low-fidelity simulation but leads to overconfidence in medical students. *BMC Medical Education, 19*(1), 29.

McGue, S. R., Pelic, C. M., McCadden, A., Pelic, C. G., & Lewis, A. L. (2021). The use of simulation in teaching. *The Psychiatric Clinics of North America, 44*(2), 159–171.

Michael, D., & Chen, S. (2006). *Serious games: Games that educate, train, and inform*. Thomson Course Technology.

Michelson, K., & Dupuy, B. (2014). Multi-storied lives: Global simulation as an approach to developing multiliteracies in an intermediate French course. *L2 Journal*, 6(1), 21–49.

Motowidlo, S. J., Dunnette, M. D., & Carter, G. W. (1990). An alternative selection procedure: The low-fidelity simulation. *Journal of Applied Psychology, 75*, 640–647. https://doi.org/10.1037/0021-9010.75.6.640

Mundell, W. C., Kennedy, C. C., Szostek, J. H., & Cook, D. A. (2013). Simulation technology for resuscitation training: A systematic review and meta- analysis. *Resuscitation, 84*(9), 1174–1183.

Naweed, A., & Leigh, E. (2021). Sight beyond sight: A conceptual exploration of the 'gaze' in facilitating simulations. *Simulation & Gaming, 52*(3), 290–311.

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education, 25*(1), 85–95.

Parker, B., & Myrick, F. (2010). Transformative learning as a context for human patient simulation. *Journal of Nursing Education, 49*(6), 326–332.

Polanyi, M., & Sen, A. (2009). *The tacit dimension*. University of Chicago press.

Ranchhod, A., Gurău, C., Loukis, E., & Trivedi, R. (2014). Evaluating the educational effectiveness of simulation games: A value generation model. *Information Sciences, 264*(1), 75–90.

Reeve, J. (2013). How students create motivationally supportive learning environments for themselves: The concept of agentic engagement. *Journal of Educational Psychology, 105*(3), 579–595. https://doi.org/10.1037/a0032690

Rising, B. (2009). Business simulations as a vehicle for language acquisition. In V. Guillén- Nieto, C. Marimón-Llorca, & C. Vargas-Sierra (Eds.), *Intercultural business communication and simulation gaming methodology* (pp. 317–354). Peter Lang.

Schijven, M. P., & Kikkawa, T. (2022). One Winner for Games? *Simulation & Gaming, 53*(5), 403–404.

Simon Fraser University—"Simulation and Advanced Gaming Environments for Learning" (SAGE). https://www.sfu.ca/education/research/research-projects/sage.html

Squire, K., & Jenkins, H. (2003). Harnessing the power of games in education. *Insight, 3*(1), 5–33.

Sroka, G., Feldman, L. S., Vassiliou, M. C., Kaneva, P. A., Fayez, R., & Fried, G. M. (2010). Fundamentals of laparoscopic surgery simulator training to proficiency improves laparoscopic performance in the operating room—A randomized controlled trial. *The American Journal of Surgery, 199*(1), 115–120.

Thiagarajan, S. (2003). *Design your own games and activities: Thiagi's templates for performance improvement*. NY: Pfeiffer.

University of Birmingham, UK. https://www.birmingham.ac.uk/search.aspx?q=simulation

University of Central Florida, U.S. https://www.ist.ucf.edu/

Vlachopoulos, D., & Makri, A. (2017). The effect of games and simulations on higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education, 14*(1), 1–33.

Watts, F., García-Carbonell, A., & Rising, B. (2011). Student perceptions of collaborative work in telematic simulation. *Journal of Simulation/gaming for Learning and Development, 1*(1), 1–12.

Wedig, T. (2010). Getting the most from classroom simulations: Strategies for maximizing learning outcomes. *PS: Political Science and Politics*, *43*(3), 547–555.

Wiggins, B. E. (2012). Toward a model of intercultural communication in simulations. *Simulation & Gaming, 43*(4), 550–572. https://doi.org/10.1177/1046878111414486

Woodhouse, T. (2011). *Thai university students' perceptions of simulation for language education.* http://www.thaisim.org/ts2011/docs/TS11_prog-book_f.pdf

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A Roadmap to Simulation in Education

2

Elyssebeth Leigh, Irwyn Shepherd, Amanda Davies, and Elizabeth Tipton

Overview

A structured model for use in deciding when and how to include simulations and games in educational programs is introduced here. The model is based on extensive research into relevant educational theories underpinning simulation design and practices and is located within a macro-level analysis of factors affecting curriculum development. The intention is to illustrate the complexity as well as the benefits of using active learning strategies—especially simulations and games—to engage students in their own learning processes and encourage educators to expand their options for learning design.

Keywords

Simulation · Education · Education model · Learning design · Case studies

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Learning Objectives

Readers of this chapter will explore how

- current and emergent changes are affecting approaches to learning;
- simulations and games as learning strategies align with locally relevant learning frameworks;
- formal education contexts are subject to a complex array of (often) conflicting forces that shape curriculum activities;
- a theoretically supported education model can apply to the choosing and using of simulations and games in their own contexts.

2.1 Introduction

This chapter explores the impact of the significant interruptions generated by the COVID-19 worldwide pandemic[1] that began in late 2019. Its rapid spread across the globe in early 2020 and beyond generated major resettings in design, delivery, evaluation, and assessment of conventional education at local, national, and international levels. Shifting societal demands and an array of disruptions to education services have caused the need for significant transitions in education delivery. The chapter focuses on how the appropriate use of simulations and games aligns with the application of emerging technologies, changing student demographics and learning attributes. A brief review of current uses of simulation in education is combined with an identification of other domains that are embracing and embedding simulation and games into their work fabric and business models, thus providing potential opportunities for emulation by the education sector.

While most feedback activities, such as effective feedback characteristics and tips, and the use of digital portfolios provide room to progress professionally,[2] there is also feedback that may cause teachers to believe that student successes and failures in learning are directly linked to their teaching styles. How to counteract such feedback requires understanding about and application of a number of simple, preventative measures and coping techniques in dealing with student evaluations.[3] To counteract this, increasingly, guidelines exist to assist both the teacher trainer and even the more experienced educator transition to new ways of interaction with students and learning processes in the evolving digital technology space (see footnote 2).

[1] COVID-19: The first documented coronavirus pandemic in history. Further information related to the pandemic.

[2] https://www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-feedback.aspx. This site offers effective feedback characteristics and tips.

[3] https://www.insidehighered.com/blogs/gradhacker/how-deal-negative-teaching-evaluations. This site offers preventative measures and coping techniques in dealing with student evaluations.

These guidelines draw on several principles, among the most important being that they are intentionally designed to shift from being educator centric to being student centric. Indeed, in this changing education technology environment, simulations and games support redirecting educators' attention and thinking away from a belief that they are fundamentally responsible for teaching students and the sole evaluator of the students learning. Simulation and the gamification of learning increase student engagement, interaction, and assessment activities as do other emerging educational views, such as dialogic pedagogy[4] where both teachers and students are encouraged to talk and think in a way that identifies, considers, and values a range of different perspectives that can in turn lead to new understandings. This pedagogical view resonates strongly with the simulation activities of experiential learning, debriefing, and guided reflection.

These emerging sets of conditions invite educators to accept that while responsibility for learning exists, it can be facilitated by anyone in a group, such that everyone may impact the totality of learning. Where past frameworks may have led educators to believe that success and failure in student learning are about what they, as teachers or leaders, did or did not do, simulations and games take the learning environment far beyond this limited and limiting belief into the realm of shared responsibility for teaching and learning.

Simulations and games provide effective means for implementing modern learning theory, especially concepts of student-centered design, for building learner autonomy in 'safe to fail' environments, and toward achieving independent and life-long learning. Rather than a tight focus on content, simulations in the hands of expert and well-prepared facilitators focus attention on the entire learning process including the setting, the group, and the individual, as well as the multiple interactions among all of the elements, where all involved may at different times be teachers, learners, and collaborators in creating new knowledge.

This chapter ties together contemporary knowledge of theories of learning and the challenges teachers face as familiar certainties are challenged by the quickening pace of change. To help teachers map these interrelationships and learn more about how to position themselves and their influences appropriately in regard to intended learning outcomes, current applications of learning frameworks with an exploration of how simulations and games can be used to develop and apply immersive learning experiences within and across school curricula are described. All of this assists teachers to prepare for, become comfortable with, and more effectively manage the approaches of emergent learning typical of the unsettled and discomforting discontinuities of twenty-first-century life.

[4] http://21stcenturylearners.org.uk/?p=1337. An article on dialogic pedagogy.

2.2 In the Beginning

Before delving into discussions on a roadmap to simulation and games in education, a fundamental question must be asked—*why* use simulations and games in education? Such a question could be seen to imply that these formats are not used in conventional education, which is not the case. They are already being applied in many ways as reported formally and anecdotally, empirically, and through evidence-based publications. Simulation and games have also been used throughout history. One example of the use of simulation and games for learning comes from reports of how Pacific Northwest Indigenous Tribes in what is now Canada and the USA use Simulations and Games for the transmission of key skills and have done so for hundreds of years. Similarly, in Australia, Indigenous civilizations which have been in residence for thousands of years make extensive use of simulations and games to ensure knowledge is acquired by each new generation.

As early examples, the development of teachers for the education profession has seen the use of simulation for the preparation of teacher students. De Jong et al. (2012) comment on the value and relevance of simulation as an educational pedagogy in the preparation of student teachers by providing strategies on how to normalize their emotions in the classroom. Whereas Adams et al. (2008) in a two-part presentation on a study of educational simulations explore the impact of educational simulations, acknowledging issues around engagement and learning and interface design, and report that evidence indicates simulation must flow intuitively or the student's attention is focused on the simulation, rather than on the topic (Adams et al., 2008).

More recently the work of Campos et al. (2020) discusses the application of simulation-based education in a selection of European universities and their connections with learning. The authors conclude the ease of integration of a simulation-based education approach within blended and online courses is a key factor in its rapidly increasing application by educational institutions signposting both efficacy and expansion in the future of educational design. At this time, the improving skills of both learners and educators are driving these increases, and there is more change ahead.

Similarly, the work of Ferguson et al. (2020) resonates with Campos et al. (2020) in agreeing that there is an expanding body of literature to support the use of simulation-based education (Ferguson et al., 2020 work refers to healthcare education). An insightful work by Chernikova et al. (2020) evaluating the varying types of scaffolding to facilitate effective learning through simulation-based education points to the positive value of simulations as a mechanism to facilitate the learning of complex skills. The literature evaluating the use of simulation in the training context for police, military, and health, to name a few (see Fischer et al., 2020; Haginoya, 2020; Chen, 2021; Davies & Heysmand, 2019; Davies, 2015), has been increasing exponentially, supported in part by training simulations scaffolding on the affordances of technology drawn from the entertainment and gaming fields.

At the 2021 Asia-Pacific Games for Change (G4C) conference, the innovative Australian Centre for the Moving Image (2021) unveiled its extensive program of games-based classroom materials, an indicator of the span of resources available for any teacher to use. Also in a recent literature search using 'Game-based learning in Europe', the key search term drew together 1.4 million references. An analysis of all that data is beyond the scope of this chapter—but two things were quickly evident. First, many of the articles concerned the design of games for learning with less attention on helping educators make the necessary shift in thinking required to successfully use the resulting designs. Second, there were very few indicators of where educators can go to learn about how to make that shift in thinking or what it actually involves.

From a curriculum perspective, Fig. 2.1 provides an insight into the array of academic, student, and educator demographic, social, cultural, and community forces seeking to shape and influence the design and delivery of formal education. Based on the work of Wilson (2020), this introduces eleven types of curriculum arranged in five clusters according to the driving forces for each specific curriculum. While a common reading of 'curriculum' appears to refer only to what is called here the *overt, explicit, or written curriculum*, Wilson's work highlights the complexity of those forces that attempt to influence what is taught and how it is provided. To understand the intentions of such tools as 'learning frameworks' requires some prior knowledge of these forces and their interactions (Fig. 2.2).

Within their own teaching space, educators have a degree of autonomy as to how they operate but this is inevitably constrained by such things as their own view of how to enact their role (Wilson's 'curriculum-in-use') and how this is received and internalized by their students. Outside the teaching space, while these exchanges are happening inside, eight other sets of forces are straining to influence what happens inside it. At the level of institutional engagement, aside from the 'explicit' curriculum, there is the 'rhetorical' curriculum where 'learning frameworks' seem to fit most easily. While these may be described as 'ideas offered' they clearly carry political and financial weight and may have very different impacts in differing contexts.

Less easy to discern, and therefore harder to address explicitly—unless some additional effort is applied—are the 'invisible' sources of curriculum content. It is important to note that this is the largest group of curricula, implying that there is much we do not yet know nor fully understand about how educational practices and content are actually shaped on a daily basis. The 'covert' curriculum is often absorbed by all participants in education contexts without conscious cognition of its existence. The 'null' curriculum by its very name appears not even to exist—except that what is not included may be even more powerful than what is addressed.

The power of the 'phantom' and 'electronic' curricula is only slowly being revealed as educational processes that examine more closely their boundaries and intersections with learning which occurs outside formally constituted 'education'

(Source is) INSTITUTIONAL	
Overt, explicit, or written curriculum	Written /produced documents chosen to support an institution's intentional instructional agenda. This term is usually confined to those written understandings and directions formally designated and reviewed by administrators / curriculum / directors / teachers.
Rhetorical curriculum	Ideas offered by policymakers, school officials, administrators, or politicians.
(Source is) - TEACHER	
Curriculum-in-use	The actual curriculum as delivered and presented by each teacher
(Source is) - STUDENT	
Received curriculum	Those things that students actually take out of the classroom
Internal curriculum	Processes, content, knowledge combined with the experiences and realities of the learner to create new knowledge. While educators should be aware of this curriculum, they have little control over the internal curriculum since it is unique to each student. NB *It may be enlightening and surprising to find what has meaning for learners and what does not*
(Source is) - INVISIBLE	
The hidden or covert curriculum	This includes such things as emphasis on sequential room arrangements; cellular, timed segments of formal instruction; expectations about classroom behaviour. It may include both positive or negative messages, depending on models enacted and learner perspectives. It is derived from the very nature and organizational design of the public school, as well as from the behaviours and attitudes of teachers and administrators.
The null curriculum	All that is **not** taught, thus conveying the message that these elements are not important in their educational experiences or in our society. There are consequences not only by virtue of what [is taught], but also by virtue of what [is neglected]. What students cannot consider … they are unable to use, [and this has] consequences for the kinds of lives they lead.
Phantom curriculum	The messages prevalent in and through exposure to any type of media can play a major part in enculturation of students into a predominant meta-culture, or narrower or generational subcultures.

Fig. 2.1 Types of curricula influencing learning (based on Wilson, 2020)

The electronic curriculum	Those lessons learned through searching the Internet for information, or through using e-forms of communication.
(Source is) - COMMUNITY	
Societal curriculum (or social curricula)	The massive, ongoing, informal curriculum of family, peer groups, neighbourhoods, churches, organizations, occupations, mass media, and other socializing forces that "educate" all of us throughout our lives.
Concomitant curriculum	What is taught, or emphasized at home - may be received at church, in the context of religious expression, lessons on values, ethics or morals, etc. based on the family's preferences.

Fig. 2.1 (continued)

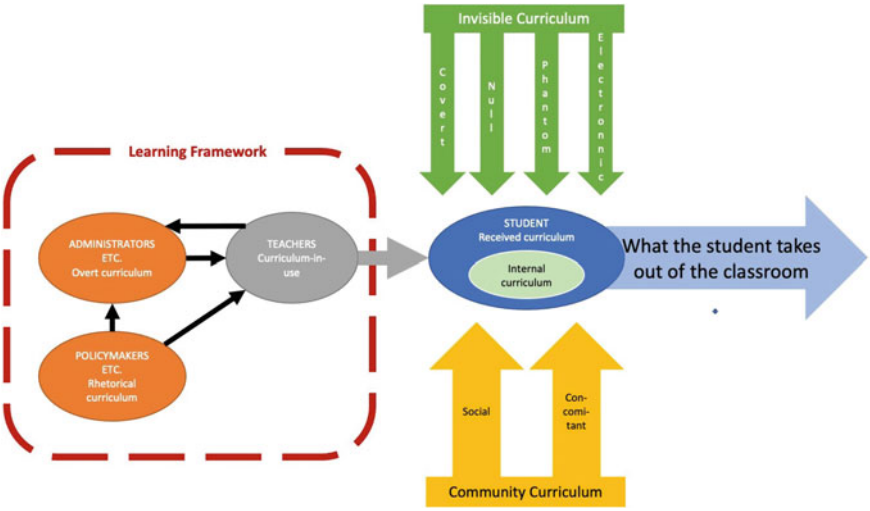

Fig. 2.2 A visual representation of Wilson's 11 types of curricula. The 11 curricula types are arranged in one particular format in this image. In different contexts we can imagine the weighting of items and their relationships might alter dramatically (Based on Wilson, 2020)

settings. 'Societal' and 'concomitant' curricula are clearly visible, and often noisy influencers in shaping how curricula are selected and applied, while seldom formally being identified as such.

2.3 Learning Frameworks

The emerging emphasis on 'learning frameworks' such as the Early Years Learning Framework for Australia and the Framework for School Age Care in Australia attests to the potential for educators to consider simulation[5,6] Such frameworks claim to provide a high level set of operating principles intended to guide educators in aligning their curricula with changing conditions and trends in learning theory and practice. In Australia, a learning framework is defined as a document based on research and with a purpose. The purpose of the national Australian learning frameworks—operational toolkits developed from overarching institutional curricula—is to provide professional educators with a foundation for creating a successful learning environment for children. Such learning frameworks—reflecting institutional (overt, explicit, and rhetorical) curricula—are essentially designed to allow for a range of interpretations and use.

As such they guide the design, development, and delivery of the teacher's 'curriculum-in-use' as developed and delivered to the students. The Australian learning frameworks refer to 'play' and 'games' as viable strategies while not specifically extending this concept to include what we understand simulation-based education to be. Appreciatively, it may be included in practice, but what appears to be missing from the literature is evidence of an educationally focused strategic approach to their use. Thus, there is no assurance that simulations are included in curricula documents nor that their use is supported or encouraged at an operational level.

As simulation and game design, delivery, and assessment are complex and highly detailed processes, the evidence, or lack thereof, indicates that educators using simulations and games for learning are not yet supported by accepted evidence-based education frameworks and models. This chapter, therefore, provides guidance to help readers understand how to integrate the use of play-based simulations and games into the strategic concepts set out in 'learning frameworks'. It is valuable to explain what we mean by 'play', 'simulations', and 'games' and consider the various contexts where these assist learning processes.

2.4 Play and Games

For millennia, play has been a core means of human learning. However, this chapter is not delving into the deep past in effort to support such a statement. Instead, in a more contemporary context, in the early 1960s, Holt (1972) explored the role of play in children's learning, and well before that Johan Huizinga (1949) had

[5] *BELONGING, BEING & BECOMING*. https://www.acecqa.gov.au/sites/default/files/2020-05/belonging_being_and_becoming_the_early_years_learning_framework_for_australia.pdf. This links to the Early Years Learning Framework for Australia document.

[6] Framework for School Age Care in Australia https://www.google.com/url?q=https://www.acecqa.gov.au/sites/default/files/2020-05/my_time_our_place_framework_for_school_age_care_in_australia.pdf.

embedded 'Homo Ludens' (the play element of human culture) as a sociological concept relevant to all human societies.

For Huizinga, play preceded human culture; since animals of all kinds are also adept at play, in its human form, play is free and not real. It is separate from the 'ordinary' aspects of life and creates order while being separated from any intent to gain a benefit or profit—it is 'for its own sake'. So this may be why conventional education finds it so hard to include play as a 'teaching' component in contexts where a benefit of some kind is supposedly central to the purpose of action. Formal education is about acquiring knowledge for the personal advantage of some kind—so playing with knowledge may seem antithetical to such proposes.

Regardless of this, play is still part of every formal educational context—albeit less often in the classroom than it could be. The playground and other non-formal social spaces are the areas where play is more readily accepted—and often where much life-learning occurs. For our purposes, we are using the terms simulations and games to address a multitude of play-based learning forms. In brief, a simulation is a means of replicating/representing some single or cluster of aspects of real life. It *'enrolls'* participants for the duration of the action to provide participants with a low-to-no threat experience of real life in order to rehearse expected behaviors, explore possible rationales for known actions, or develop predictive indicators for future actions.

Its structure is framed within a scenario made known to participants, which may also have unexpected elements creating uncertainties to be resolved through action. Games have rules and time-bound frameworks and may include roles. They are less 'real life' like and the focus is on solving problems or 'playing' with artefacts. However, both simulations and games easily incorporate learning goals and provide fictional realism for the adventurous exploration of many serious learning topics. So now we turn to an exploration of places where simulations and games are currently used and can potentially operate in education.

2.5 Simulation in Other Domains

A roadmap has a beginning and it would be remiss not to provide a brief summary of the emergence of simulation in the education [and training] fields. In 1988, Hays and Singer (1988) in referring to simulation as the replication of reality suggested rudimentary simulation was utilized as early as the middle ages, particularly in battle training and birthing. Forward to the work of Salas and Cannon-Bowes (2001), in reporting on the development of simulation in education and training, with the authors referring to the development of sophisticated, technological advances producing ever-increasing realism in simulation-based learning environments. The military, such as the Australian Defence College,[7] and the aviation

[7] Home: Wargaming and Simulation Centre. This is a link to the Australian Defence College website.

industry for example QANTAS airlines[8] are early adopters of the advances in simulation design for their cost effectiveness and efficiency of training and shone the light on this form of learning approach for other professions, such as policing, healthcare (Victoria Department of Healthcare Workforce Education and Training platform),[9] and engineering, to name a few. While the early twenty-first-century emergence of simulation-based learning design was varied in design and application, the common goal was to provide opportunity for learners to apply knowledge and skills and test themselves and others in a 'practice environment'.

As we move to 2022 and beyond, the plethora of literature on the design and application of simulation-based learning in a myriad of professions, medicine, dentistry, aviation, military, policing, engineering, business, and healthcare (and this is not an exhaustive list), is valuable for the insight it brings to the education community on what didn't work and what works such as what is described from a simulation-based medical teaching and learning perspective.[10]

It is important not to lose sight in the twenty-first-century technology-connected world that not all simulation-based learning requires sophisticated and often expensive technology. The key is about fit for purpose and following your roadmap as an educator to enhance the experience of your learners.

Exemplars

As identified earlier in this chapter, many organizations, businesses, and industries that need to ensure they remain functional and safe have embedded simulation strategies and activities within their very fabric. This is especially evident in high stakes environments where organizational and human safety is paramount such as mining,[11] engineering,[12] aeronautical,[13] seafaring,[14] nuclear[15] plus petroleum, space, environmental, defence, policing, and many more. All of these footnote links offer a range of different perspectives due to their areas of activity, but the core focus is using simulation to mitigate risk and reduce losses (such as life, infrastructure, productivity, outcomes, revenue, and support).

Indeed, as an example close to the discipline of education, simulation in healthcare education has blossomed over the last 30 years from a 'market garden' approach to what is now a discipline-specific, interdisciplinary, and multidisciplinary national and international movement. A fundamental goal was and is to improve knowledge, practice, and attitude in the workforce so as to improve patient

[8] Flight training. This is a link to the Qantas training website as an example of the use of flight simulation.
[9] Simulation program. This is a link to the Victoria Department of Healthcare Workforce Education and Training platform website.
[10] Simulation-based medical teaching and learning. This is a discussion article on clinical skills, medical education, medical simulation, and simulators.
[11] Mining Training Simulators.
[12] Engineering simulation.
[13] Ansett Aviation Training: Home.
[14] Simulation studies for maritime operations.
[15] Nuclear Reactor Simulators for Education and Training|IAEA.

safety and outcomes. Many collaborations, local and cross-boundary investigative and translational research, significant infrastructure and human capital investment, and evolving communities of practice now demonstrate levels of maturation in design and delivery, broadening of scope, and a collective desire to aim for even more translational impacts where translational simulation is used to help improve patient care. Educationally designed and evidence-based simulation activities can facilitate a review of healthcare teams and system performance that in turn helps design and test improvements (Brazil, 2017) through simulation.[16]

However, this development has not come about in a vacuum. It has had its fair share of detractors and pushback, especially from an economics and management perspective. In early developments management was asked to spend—but a return on investment was not easily forthcoming. Direction and momentum changed when consistently emerging evidence demonstrated that simulation positively impacted clinical practice and indirectly impacted patient outcomes. Also, a return on investment could be more effectively demonstrated, along with improvements in a number of sociocultural domains and human factors such as communication skills, teamwork, leadership, crisis resource management, and metacognitive processing (Bukhari et al., 2017).

In unison with this development was the increasing understanding that to demonstrate meaningful outcomes, the need to use educational modeling to guide the design, build, delivery, and measurements of simulation interventions became more evident. While the literature demonstrates this growth in awareness and application, this journey has been spasmodic initially. There is now a broader recognition, acknowledgment, and acceptance that education philosophies, education frameworks, and education models are important prerequisites in simulation development, delivery, and evaluation.

Another valuable lesson learnt early on was identifying the who, what, why, when, where, and how simulation might be of value. While initial simulations focused on repeating scenarios based on challenging issues—in health education this might be the 'deteriorating patient' or advanced life support—it became increasingly obvious that the curriculum needed to be revisited. Identification of areas of complex learning and practice that would be better suited to the use of simulation were identified and interventions were built around these. The goal here was to proactively introduce learners to these diverse activities in a safe and quarantined environment, where mistakes could be made without external ramifications, and the entire process could be discussed and reflected on as an educational process, rather than a reactionary process to a clinical problem. This approach has gained high levels of maturity.

[16] Translational Simulation Collaborative. All of the above links provide evidence of the use of simulation in their respective industries.

2.6 Transitioning to Mainstream Education

While there may well be many areas where educational theory and models will be driving simulation in mainstream education, it could be argued that a similar approach to that of healthcare could be advocated as an example of best practice and governance. This then becomes a starting point for those entering the discipline of education, those already in the education industry who are looking for a different or novel approach to their existing teaching and learning armory, and those managers who are keen to pivot how their curricula are delivered. This is particularly relevant in the face of emerging hardware and software technologies, the changing education workforce, societal and cultural changes in a highly linked technology world, along with political, parental, student, and employer/business expectations (Pang et al., 2019).

2.7 Simulation as a Change Agent

This transition to include a simulation-based learning approach helps address the need and necessity for a fundamental planned shift away from the more traditional approaches to teaching and learning and in parallel address the expectations of the new generation of student-centered and digitally connected learners. A significant change in student and parent demographics and expectations requires almost a forensic approach to what is being provided—and what can now be provided. An international pandemic disrupting the delivery of education worldwide has triggered the rapid transition from predominantly classroom-based to online digital education, using a plethora of web-based learning platforms, live streaming, and video connectivity.

Learning management systems have been quickly repositioned to deliver via digital devices (e.g. computer and smartphone) that which the teacher historically controlled in the school environment. Hybrid learning has become the catchphrase. Almost without exclusion all education organizations, in order to remain relevant and continue education delivery, have had to embrace and work through this rapid change challenge. This change process, which transcends national and international borders and cultures, with advantages and disadvantages provides an opportunity to reflect on the transition and capture ideas, suggestions, guidance, and processes—for embedding simulation-based learning into the new normal for education delivery.

Simulations support many aspects of modern learning theory, across the existing educational paradigms of pedagogy, andragogy, and now with heutagogy (Blaschke, 2012) which drives the use of student-centered learning design with the goal of building learner autonomy toward independent and life-long learning in this technology era. It encourages adaptive learning[17] where the delivery of education or

[17] Adaptive Learning: What is It, What are its Benefits and How Does it Work? Adaptive learning enables the learner to individualize and self-pace their learning. It can be monitored and provided feedback.

training is using digital technology to provide a more individual student-oriented, customized learning program that intelligently adapts to their learning needs. A personalized learning path can be provided for each student, which encourages increased engagement—as it allows for frequent practice while providing immediate feedback. This also reduces educator workloads.

2.8 Those Early Years

It is well recognized that teacher-led simulations in early childhood encourage students to absorb what is being presented and to use their developing imaginations to make sense of an activity. In Storytelling, the use of learning materials (paper, pencils, pens, and paints) linked to stories generates individual and collective responses (ideally). As the children progress from pre-school into primary school, these learning-based narratives become more complex and focused, in keeping with the appropriate curriculum and the cognitive and sociocultural development of the students. This continues into the senior school years, the vocational space, and the higher education arena—the tools of delivery and engagement becoming increasingly more sophisticated with the maturation of the learners' competencies. The question remains—is there an overarching learning framework or a set of frameworks and models that will guide development and encourage deeper learning using simulation?

2.9 Simulation

To enable an understanding of 'why simulation', it is valuable to first offer a response to the question 'what is simulation?' Simply put, simulation is a teaching and learning method (Beyea & Kobokovich, 2004; Binstadt et al., 2007) that can be designed, delivered, and measured more effectively if potential users (educators) have acquired a comprehensive understanding of the underpinning education philosophy theories, frameworks, and models that support simulation (Bordage, 2009; Shepherd, 2017). Armed with this important knowledge, educators can be more confident in its strategic use as part of their teaching toolbox and be able to engage students in innovative ways, especially as simulation affords the opportunity for safe learning activities to occur, where mistakes can be made, where a failure is an option, and feedback provides the learning (of note, simulation-based activities in a number of high-risk professions, military, policing, and aviation, are also designed where the participant may experience failure and a level of insecurity/lack of safety and these are fundamental to the learning design, preparing and testing the participant for the reality of the real world of their working environment).

2.10 Education Philosophy and Simulation

Cognitive and social constructivism (Shepherd, 2017) is identified as being a strong contender as an underpinning education philosophy for simulation-based education. Beginning from our earliest formative learning years, on almost a daily basis, as enquiring humans we have been exposed to new information, from both a cognitive and social perspective. This may be new knowledge or additional knowledge that challenges current understanding and makes you critically review what you understood to be valid. Any social dimensions presented may also encourage a 'deconstructing' of thought and beliefs and allow you to review, reflect, and accept these new views—to 'reconstruct' your knowledge and position.

There are a number of educational theories that facilitate the development of responses to the 'what, where, when, why, and how' questions supporting simulation as a tool to benefit learning and teaching. These include adult learning theory or andragogy, self-determined learning or heutagogy, theory associated with tacit knowledge, theories associated with learning styles, characteristics or preferences, experiential learning theory, critical thinking theory or metacognition, theories related to the reflective learner such as guided reflection, theories attributed to skill development and competence, theory on deliberate practice and expert performance, and theory related to self-efficacy (conceptual framework web link).

It is not the intent of this chapter to provide extensive information about all these different theories as there is significant available literature. In the context of simulation-based learning, the work of Shepherd (2017) and Shepherd and Burton (2019) and more recently Ross (2021) offers a valuable review of a number of learning theories and their application in simulation.

Gaining further insight through such an overview will potentially arm the educator with a broader and deeper understanding about these interrelated theories and their relationship to simulation design, development, delivery, and evaluation. A further activity is to develop the ability to critically consider how the underpinning constructivism approach and each of the educational theories intersect and decide where they have a role or not in the overall simulation.

2.11 Next Steps

Ideally, simulations should not be designed and developed in an 'educational vacuum' or in an 'atheoretical' sense. Application of an iterative instructional design-based model and process that guides the educator to identify the necessary information and tools to develop a best-practice set of activities results in a simulation event that has educational fidelity (Shepherd, 2017; Shepherd et al., 2019). Developed using a range of educational and instructional design principles, the ADELIS model (Shepherd et al., 2019) offers the educator a roadmap to simulation design (see Fig. 2.3).

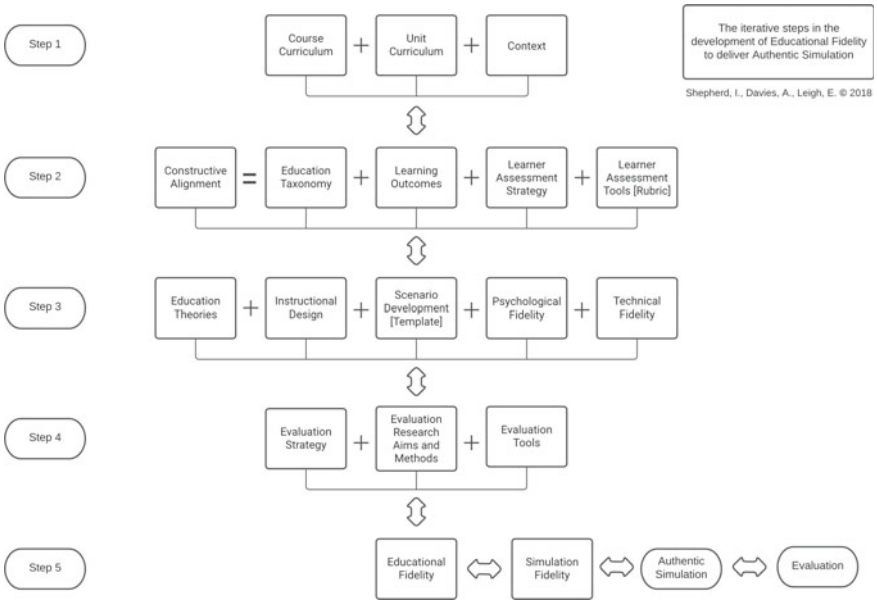

Fig. 2.3 The ADELIS model (Shepherd et al., 2019)

At the highest level in Step 1, the relevance for the use of simulation is assessed through a needs analysis process. Single simulation interventions for either a unit of study that would supplement or even replace a current education delivery activity (such as text, lecture, PowerPoint, or video) or a series of scaffolded simulations that cover key elements across a course need to be identified. Importantly, the context of the simulation(s) needs to be clearly articulated. This provides the initial 'why' parameters that will need further development.

In Step 2, the process of constructive alignment is considered first. With guidance from an education taxonomy, such as Bloom's Taxonomy (Adams, 2015), the most appropriate action verbs are identified that the educator/s considers best represents the area of learning being developed. The action verbs are subsequently embedded into the specific learning outcomes for the topic, course, and program in which the simulation will be a part of the learning experience. Assessment of the extent to which a learner achieves the learning outcomes requires consideration of the form of measurement, be it either formative or summative, and the associated assessment tool, for example, an assessment rubric.

Step 3 requires consideration of the how, what, when, and where of the simulation. Simulations require various levels of immersion, activity, and interactivity coupled with post-simulation reflections. An understanding of the educational theories that support this becomes relevant here as not all simulation activities require a host of supporting theories. There are, however, a number of theories essential for successful simulation design—keeping in mind that there are many instructional design models such as ADDIE (Analysis, Design, Development,

Implementation, and Evaluation) that help organize and streamline the production of course content. This is important for simulation as it provides educational integrity to the build.[18] Access to a simulation scenario template that embraces constructive alignment principles is a valuable tool to enable the educator to consider how and to what degree the levels of psychological and technical fidelity need to be addressed within the simulation.

Step 3 is both critically and pivotally important as it is here that the credibility of the simulation activity needs to be clearly deliberated. A simulation is a learning outcomes-guided approximation of a real-world event or process, which implies there are a number of considerations to address. These include, with the constructive alignment step in mind, the briefing, orientation to the scenario, and carefully selected cues and clues that will capture the imagination of the learner and allow them to 'engage' with or 'buy into' the simulation as if it was the real world.

This aspect, from a psychological fidelity perspective, is often referred to as 'suspension of disbelief' or the 'fiction contract' (Shepherd, 2017). The learners begin to encounter a shared understanding—a shared mental model[19] that the educator is attempting to establish. In identifying this engagement goal and process, it is important to acknowledge here that all this activity needs to include consideration of the overall psychological safety[20] of the learner—they need to feel comfortable that the simulation will be of value and not cause undue stress or anxiety (unless these are key attributes of the simulation design in specific learning contexts, e.g. policing, military, aviation, and medicine).

Cues and clues will be verbal, written, photographic, or video imagery as part of establishing the context and allowing the learner to construct a visualization (a mental picture), both as a starting point in the simulation journey and to sustain the sense of immersion, presence, and co-presence. It is at this point that interactivity is facilitated if that is an expectation—as part of the learning outcome(s) is introduced. This process is seen as establishing varying levels of psychological or functional fidelity. Whereas other stimuli (cues and clues) may be set up in the physical environment (the infrastructure) the learner is exposed to and referred to as the technical (environmental, equipment) fidelity. The psychological and technical fidelities provide various levels or measures of the realism of a simulation.

These fidelities are not mutually exclusive, so it is important to consider their overall fidelity mix, so as to mitigate the opportunity for the learner to slip into a 'comfort zone' and not buy in, or be overloaded and unfocused but more likely to be the in the learning and/or performance zone (McLeod, 2017).[21] A good

[18] ADDIE: 5 Steps To Effective Training Courses. This link further describes the steps of the ADDIE instructional design framework.

[19] Shared Mental Models. This link further describes the concept of a 'shared mental model'—a process of student engagement.

[20] https://thedebriefingacademy.com/wp-content/uploads/2019/01/Kolbe_PsychSafety_BMJSTEL_2020.pdf. This link provides further information on the need to ensure debriefing is psychologically sound.

[21] Zone of Proximal Development and Scaffolding. This link further describes the work of Vygotsky and ZPD.

understanding of what an educator wants to achieve—and this takes practice—is paramount during the design and development process, to achieve an optimal combination of fidelity factors and scaffolding activities. This becomes more evident in the final aspects of the simulation where guided reflection[22] can be used to ascertain how well the learning outcomes have been achieved and, importantly, the extent to which the simulation offered the opportunity for the learner to demonstrate achievement of the learning outcomes.

This leads to Step 4 where the evaluation of the educational impact of the simulation intervention using a research-focused approach is an important phase in the roadmap as it contributes to the validation of the simulation design. As mentioned earlier in the chapter, constructive alignment requires you to ascertain how you will measure the level of achievement of the intended learning outcomes. That includes capturing and analyzing student responses, which may cover a range of measurements (knowledge, comprehension, analysis, application, and attitude).

Step 4 requires determining the type of data and data collection tools that will contribute to evaluating the achievement of the fundamental aim of the simulation. Guidance to accomplish this phase is drawn from understanding the types or methods of research to be applied—descriptive, analytical, applied, exploratory, or translational. Consideration of the type of data to be captured, i.e. quantitative, qualitative, or a mix of both will guide the data collection tools which may include pre- and post-simulation participation surveys, participant and non-participant observation, video capture, and interviews.

Step 5 allows the simulation developer to review and reflect on what has been developed. It is suggested that working through the iterative process of the ADELIS model will result in a product that will have demonstrable educational fidelity with the desired levels of simulation fidelity (Shepherd, 2017). It is at Step 5 the educator is in a position to consider the steps on the roadmap that have led to developing, from an educational perspective, an authentic simulation environment and exercise that closely represents the real-world approach, setting, or activity. Importantly, confirmation at this step offers confidence that what has been designed and delivered will demonstrate measurable levels of authenticity, validity, and reliability[23] during any subsequent student assessment and simulation evaluation. From a research perspective, this is important as it establishes a sound basis for future translational studies where the impact of the learning is measured in the real-world environment.

[22] Guided reflection procedure as a method to facilitate student teachers' perception of their teaching to support the construction of practical knowledge. This link further describes how to use guided reflection effectively to ensure learning occurs.

[23] Validity, reliability and generalisability|Health Knowledge. This link further describes the processes required to ensure that content, delivery, and measurement strategies work within and across different activities.

2.12 Case Studies

The following case studies briefly describe how the use of educational theory and the education model ADELIS benefited the developer/educator and the learners. The following may resonate with educators, whereby simulation-based learning has been embedded in the learning design for a course/subject/program and on reflection has followed the steps in the ADELIS model. This is the situation experienced in the following two cases and in part contributed to the articulated design of the ADELIS model (Table 2.1).

Table 2.1 ADELIS application in a police case study

Step 1	Step 2	Step 3	Step 4	Step 5
Course curriculum/content	Construction Alignment Education taxonomy – Learning outcomes – Learner assessment why simulation?	Education theoretical design +simulation design and fidelity (technical, psychological)	Evaluation of Simulation based learning design	Validation of inclusion of educational fidelity to create authentic learning and assessment experience
Application to case				
Investigation management—theory to practice	Learning outcome 1: Demonstrate application of 'golden hour' in investigation practices	Computer desktop scenario—a video streamed scenario supported by interjections of phone call and information updates (visual, audio stimuli)	Two pathways of evaluation applied: 1. Student assessment results indicating the scenario enabled demonstration of application of knowledge 2. Post course survey requesting feedback on the simulation design for enhancing application of knowledge and transfer to the field of practice	Post Simulation Based Learning Survey for Students and Instructor results utilized for validation of authentic simulation based learning environment and exercise and continuous improvement action

The first case is drawn from simulation-based learning applied in a police education context. In this learning event design process, the Learning Outcomes were established, the knowledge acquisition content determined, and the simulation environment and exercise necessary to enable the students to demonstrate the application of knowledge acquisition identified. The measurement tools for assessing student application of knowledge and level of competence through participation in the simulation exercise were developed—the measurement tools enabling assessment to align with the learning outcomes. Of note, in this case, the computer-based simulation scenario exercise rolled out aligned to real time the students' performance monitored by camera.

The second case involves the development of online games for accounting courses. When these learning designers encountered the ADELIS model, problem/learning outcomes were already known. The goal was to turn dry financial topics into an engaging learning experience contributing to their understanding and use of such tools as profit and loss statements and balance sheets.

As they worked through the process steps, the way forward became clearer and a simulation emerged. Of particular importance to them was the reminder to include assessment as an integral part of the design sequence and—emerging only later—was the vital point of psychological fidelity. Reviewing the model later helped them to identify that this had actually been an implicit factor in their considerations, and they could in retrospect see how they had done so, and importantly for the future, they expressed pleasure in being able to add this more consciously to their future design work.

Their simulation was intended for accounting and finance students and has also been used for introducing healthcare staff to profit and loss and balance sheet accounting procedures in health contexts. One of the creative design decisions was to situate the scenario in a holiday resort on an island, thus making it a familiar kind of context but one of which most players would have little, if any, first-hand knowledge (visit at https://kilgors.com).

2.13 Summary

While simulation and games may be used in mainstream education to some degree, their strategic use and integration into education curricula remain suboptimal. While traditional teaching and learning strategies have changed marginally, it has taken a major international upheaval concerned with public health to swiftly and dramatically challenge the status quo in education delivery. Rapid, almost exponential transitions, to various modes of online learning, supported by an array of digital software platforms, have swept the education domain worldwide. Change for the survival of education services and the welfare of students and educators across the learning spectrum has been of a magnitude as yet unmeasurable. The circumstances were a catalyst for identifying where simulation and games could be of benefit in the new dynamic.

Educational processes which are beginning to encourage the use of simulation as a legitimate alternate teaching and learning method in the digital space have been explored here. Identification of uptake in the past by other industries and organizations has been presented with a closer look at an exemplar that offers insight for educators to better understand—and guide their uptake of simulation and games in education. Importantly, a review of the educational theories underpinning simulation is described, using an education model that provides an iterative instructional design approach to developing simulation activities to deliver high levels of educational fidelity and authenticity.

The stage is set to encourage educators to look at this approach and, through the information provided, step forward to embrace and develop educationally valid games and simulations that will spark student interest and engagement. The very experiential nature, the potential for repetitive and adaptive learning plus the guided reflective nature of simulations and games increase the potential for more effective learning, memory retention, and improvements in self-confidence and self-efficacy. The value-add is that the student has the opportunity to approach the real world at all levels of education with a more comprehensive skill set and ability to contextualize to different settings.

Questions for Further Discussion

To help consolidate your thinking on the content, focus, and intent of this chapter, the following questions are provided to facilitate—through a needs analysis approach—a novel strategy that may be of value to both you and your learners:

- What remains a problematic teaching and learning subject or activity for you?
- What are the recurring issues from a student perspective (engagement, understanding, analysis, and application) that might warrant a different approach?
- Where in the curriculum do the issues arise?
- Why?
- From your reading what type of simulation do you feel might be worthwhile exploring?
- Where might you seek further evidence to support your idea?
- Who might you engage in any future design activities?
- What resources do you believe would be crucial for a successful development?
- How might you go about delivering and evaluating your project?

References

Adams, N. E. (2015). Bloom's taxonomy of cognitive learning objectives. *Journal of the Medical Library Association*, *103*(3), 152–153. https://doi.org/10.3163/1536-5050.103.3.010

Adams, W. K., Reid, S., LeMaster, R., McKagan, S. B., Perkins, K. K., Dubson, M., & Wieman, C. E. (2008). A study of educational simulations Part I—Engagement and learning. *Journal of Interactive Learning Research, 19*(3), 397–419. Association for the Advancement of Computing in Education (AACE).

Adams, W. K., Reid, S., LeMaster, R., McKagan, S., Perkins, K., Dubson, M., & Wieman, C. E. (2008). A study of educational simulations Part II—Interface design. *Journal of Interactive Learning Research, 19*(4), 551–577. Association for the Advancement of Computing in Education (AACE).

Allas, R., Leijen, A., & Toom, A. (2020). Guided reflection procedure as a method to facilitate student teachers' perception of their teaching to support the construction of practical knowledge. *Teachers and Teaching, 26*(2), 166–192. https://doi.org/10.1080/13540602.2020.1758053

Australian Centre for the Moving Image. (2021). Games lessons: Materials for use in schools. https://www.acmi.net.au/education/school-program-classmaterialsand-resources/game-lessons/

Beyea, S., & Kobokovich, L. J. (2004). Human patient simulation: A teaching strategy. *AORN, 80*(4), 738–742.

Binstadt, E. S., Walls, R. M., White, B. A., Nadel, E. S., Takayesu, J. K., Barker, T. D., Nelson, S. J., & Pozner, C. N. (2007). A comprehensive medical simulation education curriculum for emergency medical residents. *Annals of Emergency Medicine*, *49*(4), 495–503.

Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distance Learning, 13*(1), 56–71.

Bordage, G. (2009). Conceptual frameworks to illuminate and magnify. *Medical Education, 43*, 312–319.

Brazil, V. (2017). Translational simulation: Not 'where?' but 'why?' A functional view of in situ simulation. *Advances in Simulation, 2*, 20. https://doi.org/10.1186/s41077-017-0052-3

Bukhari, H., Andreatta, P. Goldiez, B., & Rabelo, L. (2017). A framework for determining the return on investment of simulation-based training in health care. *Inquiry*, *54*, 0046958016687176. https://doi.org/10.1177/0046958016687176

Campos, N., Nogal, M., & Caliz, C. et al. (2020). Simulation-based education involving online and on-campus models in different European universities. *International Journal of Educational Technology in Higher Education, 17*, 8. https://doi.org/10.1186/s41239-020-0181-y

Chen, Y. (2021). Application of simulation technology in military education. *Journal of Contemporary Educational Research*, *5*, 9. https://ojbsbbwpublisher.com. Retrieved 9 Oct 2021.

Chernikova, O., Heitzmann, N., Stadler, M., Holzberger, D., Seidel, T., & Fischer, F. (2020). Simulation-based learning in higher education: A meta-analysis. *Review of Educational Research, 90*(4), 499–54.https://doi.org/10.3102/0034654320933544

Conceptual framework web Link. https://bit.ly/2MogsLK

Davies, A., & Heysmand, M. (2019). Implications of a field-based police leadership development programme. *Policing: A Journal of Policy and Practice, 15*(2), 741–758. https://doi.org/10.1093/police/paz063

Davies, A. (2015). The hidden advantage in shoot/don't shoot simulation exercises for police recruit training. *Salus Journal, 3*(1), 16–30. https://doi.org/10.3316/informit.000414055783411

Ferguson, J., Astbury, J., Willis, S., Silverthorne, J., & Schafheutle, E. (2020). Implementing, embedding and sustaining simulation-based education: What helps, what hinders. *Medical Education, 54*(10), 915–924. https://doi.org/10.1111/medu.14182

Fisher, M., Vishwas, A., Cross, S., et al. (2020). Simulation training for police and ambulance services: Improving care for people with mental health needs. *BMJ Simulation and Technology Enhanced Learning, 6*, 121–122.

Haginoya, S., Yamamoto, S., & Santtila, P. (2020). The combination of feedback and modeling in online simulation training of child sexual abuse interviews improves interview quality in clinical psychologists. *Child Abuse and Neglect, 115*. https://doi.org/10.1016/j.chiabu.2021.105013

Hase, S., & Kenyon, C. (2001a). Moving from andragogy to heutagogy: Implications for VET. In *Proceedings of Research to Reality: Putting VET Research to Work: Australian Vocational*

Education and Training Research Association (AVETRA), Adelaide, SA, 28–30 March, AVETRA, Crow's Nest, NSW. http://www.avetra.org.au/Conference_Archives/2001a/proceedings.shtml

Hase, S., & Kenyon, C. (2001b). From andragogy to heutagogy. http://www.psy.gla.ac.uk/~steve/pr/Heutagogy.html

Hays, R. T., & Singer, M. J. (1988). *Simulation fidelity in training system design*. Springer-Verlag.

Holt, J. (1972). *How children learn*. Penguin.

Huizinga, J. (1949). *Homo Ludens*. Routledge & Kegan Paul Ltd.

De Jong, T., Lane, J., & Sharp, S. (2012). The efficacy of simulation as a pedagogy in facilitating pre-service teachers' learning about emotional self-regulation and its relevance to the teaching profession. *Australian Journal of Teacher Education, 37*(3). https://doi.org/10.14221/ajte.2012v37n3.6

McLeod, S. A. (2018). *Lev vygotsky*. Retrieved from https://www.simplypsychology.org/vygotsky.html

Pang, E., Wong, M., Leung, C. H., & Coombes, J. (2019). Competencies for fresh graduates' success at work: Perspectives of employers. *Industry and Higher Education, 33*(1), 55–65. https://doi.org/10.1177/0950422218792333

Ross, S. (2021). Simulation-based learning: from learning theory to pedagogical application. *Internet Journal of Allied Health Sciences and Practice, 19*(4), Article 15. https://nsuworks.nova.edu/ijahsp/vol19/iss4/15

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: A decade of progress. *Annual Review of Psychology, 52*, 471–499.

Shepherd, I., & Burton, T. (2019). A conceptual framework for simulation in healthcare education-the need. *Nursing Education Today, 76*, 21–25.

Shepherd, I., Leigh, E., & Davies, A. (2019). Disrupting the familiar: Applying educational theories to simulation-based learning and assessment design. In A. Naweed, L. Bowditch & C. Sprick (Eds.), *Intersections in Simulation and Gaming: Disruption and Balance*. Third Australasian Simulation Congress Proceedings, ASC 2019, Gold Coast, Australia, September 2–5. Springer Singapore Print ISBN: 978-981-329-581-0, Electronic ISBN: 978-981-329-582-7. Book Series: Communications in Computer and Information Science.

Shepherd, I. (2017). A conceptual framework for simulation in healthcare education, (DEd) *Victoria University Research Repository*. http://vuir.vu.edu.au/35047/

Wilson, L. O. (2020). Types of curriculum. https://thesecondprinciple.com/instructional-design/types-of-curriculum/

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Simulation in Teacher Preparation

3

M. Laura Angelini

Overview

This chapter reviews the use of simulation in teacher education. Teacher trainers and practitioners acknowledge the virtues of simulation in other areas, outside teacher training, such as business, nursing, law, engineering or economics. Many publications have suggested that simulation as a pedagogical strategy helps improve a wide range of professional skills, such as decision-making, critical thinking, dialogic skills, interpersonal competence and communication. In this chapter, I review simulation applications in teacher education. I also introduce simulation methodology and outline a prototype simulation cycle.

Keywords

Simulation · Teacher training · Teacher education · Active learning · Dialogic learning

Learning Objectives

By the end of this chapter, readers should be able to:

- understand some basics of simulation methodology;
- be familiar with the traditional simulation cycle and understand how simulation is applied in teacher education;
- be familiar with recent research on simulation in teacher education;
- use simulation in their own teacher training.

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3.1 Simulation in Teacher Education

We have already learned in Chaps. 1 and 2 about the multiple benefits of simulation in areas distinct from teacher education. In this chapter, we discuss simulation in schools of education, with the purpose of showing how simulation may complement teacher training. Schools of education are experiencing rapid change in their approaches to preparing teachers for today's demands, with the increasingly widespread use of active methodologies, digital literacy, multicultural classrooms and inclusiveness, to mention only a few. Educational institutions demand that professionals have solid educational instruction.

Back in 2002, Hoban claimed that most teacher education courses still represented a fragmented view of learning. He argued that teacher instruction had an enormous potential to structure and prevent pre-service teachers from becoming progressive practitioners. He referred to the difficulties that pre-service teachers found in dealing with life in the classroom. Other authors also observed that pre-service teachers were often unable to retrieve essential knowledge when they needed it most (Kervin & Turbill, 2003; Stronge, 2002; Danielson, 1996; Entwhistle, Entwhistle & Tait, 1993).

Now, two decades later, the situation has little changed. In an ideal setting, pre-service teachers would have an array of opportunities to experience quality classroom episodes that progressively develop their classroom practice. However, a number of barriers still need to be overcome, such as the cost of the practicum experience, school needs, school availability and university course requirements.

Yet, it is fair to say that, despite limited research conducted on in-school teacher practice, some effort has been made to optimize teacher training. Teacher preparation has gone through a change from classroom lecture and discussion to individual analysis of group roles and individual and group decision-making. This shift is built on the basis of critical-dialogical pedagogies (Kohli et al., 2015) as pre-service teachers are exposed to theoretical scaffolds and real-world situations along with debriefing activities in various forms (Fraser et al., 2018; Crookall, Chap. 6). Active methodologies, such as case studies, lesson studies or simulations, have gradually started to be developed in teacher preparation, and positive applications are finally being disseminated.

With regard to simulation, specifically, some early research by Thompson and Dass (2000), for example, shows that pre-service teachers who participated in classroom simulations did better in terms of self-efficacy than they did through only analysing and discussing isolated cases. Brozik and Zapalska (2002, 2003) and Sottile and Broznik (2004) used simulation in their teacher training as a result of their need to find a teaching approach that replicated real classroom situations. The purpose of their simulation implementation was to explore decision-making techniques. They also found that through simulation they provided an environment to work collectively with students and refine their communication skills. Probably, the most outstanding discovery was that through a non-conventional learning environment, the participants found the opportunity to develop their creativity and apply their knowledge to solve educational problems.

Ferry et al. (2004) designed a computerized simulation in an attempt to help pre-service teachers learn how pupils acquire and develop literacy skills in primary school. Pre-service teachers were assisted by a computer and were required to make a series of decisions about the management of a classroom, the pupils and classroom events. At other times, they were required to make decisions about a teaching sequence (such as how to introduce a lesson, transition activities and pre-actual-post-teaching activities). Some of the most relevant findings were that many pre-service teachers were able to make connections between their own school experience and the situations presented in the simulation. Some were also able to link the theory presented in their pre-service teacher education training to the educational challenges in the simulation scenario.

In line with virtual simulations, some popular software programmes have gained ground in teacher training, such as SimTeacher and SimSchool. SimTeacher is an online simulation for teacher education in which pre-service teachers become SimTeachers in a virtual school. They have the opportunity to apply concepts that they are learning in their teaching degrees to simulation scenarios. They are presented with virtual schools that contain fictional yet interactive pupils. SimTeachers may perform daily tasks, such as roll calling or designing lesson plans. Similarly, SimSchool is a web-based virtual classroom environment with SimStudents who have artificial emotional intelligence. They react as if they were real humans by smiling, crying, becoming frustrated, raising their hands, seeking attention and showing signs of stress. SimSchool provides pre-service teachers with significant classroom experience (Fischler, 2007).

Grossman (2009) argued that, in teacher education, attention to pedagogy was critical and that neither the research literature nor the US education reform reports of the 1980s had much to say about how prospective teachers should be taught. The author carried out a thorough literature review on how prospective teachers were taught and on how various approaches used by teacher educators might affect what teachers learn about teaching, including what they came to know or believed about teaching, as well as how they got engaged in the practice of teaching itself. She highlighted the potential of computer simulation in teacher training, which coincided with Fischler's findings. Later on, Dotger (2011) claimed that simulation as a pedagogical strategy effectively helped bridge teacher preparation and practice. Teacher trainers and researchers have thus paved the way to a more enlightened conception of simulation in teacher education.

3.2 Current Research

In less than a decade, between the years 2014–2021, several studies have been published that extoled the virtues of simulation in teacher education. The general advantage is that more emphasis is placed on the active role of pre-service teachers, who thereby are able to gain insights into the nature of the process being simulated (Bradley & Kendall, 2014; Gibson et al., 2014; Speed et al., 2015, among others).

Voices in favour of simulation in teacher preparation such as Gibson et al. (2014) or Badiee and Kaufman (2015) argue that the conventional practicum commonly assigned to pre-service teachers to collect data about their teaching practice does not always meet instructors' expectations. An obvious question comes to mind: how can pre-service teachers gain sufficient practice and awareness of the full variety of real classroom situations during their preparation? Teaching practice is the key to gaining insight and is the core of any teacher degree programme. However, this depends largely on the school mentors, the pre-service teachers' initiatives and the time spent in the school to help tackle different situations. More often than not, the practicum becomes a repository of experience more inclined to meet degree requirements than to reflect thoroughly on what actually happens in the real classroom (La Paro et al., 2018; Larsen & Searle, 2017; Sjølie & Østern, 2021).

However, some studies are little by little shaking schools of education out of their complacency by highlighting more revolutionary ideas to address the practicum gaps. The incorporation of well-designed simulations to augment the practicum has come into the spotlight, according to Finn et al. (2020), Gibson et al. (2014), Mukhtar et al. (2018), Sasaki et al. (2020), and Levin & Flavian (2022). Gibson et al. (2014), for example, urge schools of education to "get serious about simulation in teacher education" (p2). In their handbook, the authors highlight the importance of developing a broad understanding of educational situations through the study of simulation scenarios and active participation in simulations. In this way, pre-service teachers are able to delve into a thorough multi-step process. This would start with research into the problems or cases presented in the scenario and end with interaction among participants in the simulation. So far, the adoption of simulation for teacher education seems to be based on the personal initiative on the part of the teacher trainer. This may just be the initial link in a chain of events. This in turn leads to the question of what is necessary to make the use of simulation longer-lasting, to make it evidence-driven and to attract others in a process of collective design?

We may venture that teacher initiative alone is not enough. Heads of departments and Deans of schools of education should work together to ensure that sufficient practice is possible in a low-risk educational setting. This includes adopting active learning methodologies, such as simulation to foster true-to-life practice, supporting faculty research and encouraging the participation of pre-service teachers in forums, virtual exchanges and national and international virtual mobilities, in which educational issues are addressed. Most importantly, commitment must be obtained from the institutional level to guarantee training and continuity in trainers' initiatives to promote more active and realistic teacher methods of preparation.

Gibson et al. (2014, p. 4) identify three main areas to fuel simulation in schools of education: "leadership, incentives and support". Schools of education should experience a programme transformation by providing pre-service teachers opportunities of real and simulated teaching practice. This transformation involves changes in beliefs about the potential of technologies, skilful action in hiring and

supporting talented innovators and establishing an environment where risk taking and collaboration lead to transdisciplinary research, teaching and service.

Likewise, incentives must include recognizing and rewarding teacher trainers' initiatives to use their classrooms as laboratories and to try out methodological innovations under the scope of design-based research. Support has to do with providing the necessary framework for setting up and funding ongoing transdisciplinary research, teaching and the consolidation of design teams.

In addition, McGarr (2021) also introduces simulation when dealing with high levels of stress during school teaching practice. For some pre-service teachers, their lack of experience in classroom management, for instance, may be a real challenge. Simulation, however, may pave the way to real classroom practice. In this way, pre-service teachers could experience aspects of disruptive pupil behaviour in less demanding environments. They could benefit from opportunities of making mistakes without fear of negative repercussions on their academic progression. Thus, the use of simulations is increasingly considered as an opportunity to experience examples of classroom life in a worry-free environment. Research, dialogic learning among peers, teacher trainers, school mentors and decision-making stand as some of the most relevant and rewarding aspects of simulation in teacher preparation.

As our intention in this chapter is to introduce simulation as a complementary strategy in teacher training in particular, we will proceed to unfold the complex, but enriching, operative framework of simulation.

3.3 Simulation Methodology

In simulation-based training, simulations are divided into three main phases (Garcia-Carbonell et al., 2012; Kolbe et al., 2015).

Briefing (Phase I) consists of preparing the simulation. The facilitator must provide all necessary information and rules that pave the way for Action (Phase II). The briefing sessions are prior to the simulation action, and in which participants analyse topics related to the simulation scenario. It is important to highlight the value of research in this phase. Participants should document and investigate about the different topics or situations to be discussed in the scenario. They will thus be more content and linguistically prepared to interact during the simulation. The specific profiles can be strategically given to the participants after they have analysed the scenario situations from different profile perspectives. In this phase, the general objectives of the simulation are presented. The facilitator makes the teams and later assigns the profile roles to each of the members of the teams.

Action (Phase II) is where the simulation takes place. All participants have goals and responsibilities that are clearly specified in their profiles. The team leader may start the activity by thanking members for being there and addressing the problems that need solutions. Debate, discussions, negotiations and decision-making are expected.

Debriefing (Phase III) takes place after the action. All participants (intra- or inter-group) reflect on the experience, their roles and their learning process. This is the phase of reflection, sharing and evaluation at the individual and group level, where participants analyse the different tasks and results of the previous phases.

So, what are the affordances of using simulation in teacher education? Several authors have attempted to identify the potential of simulations under the scope of learning.

According to Crookall et al. (1987), Crookall and Thorngate (2009), Garcia Carbonell et al. (2012), Hoban (2002), Jones (2013), and Klabbers (2009), the simulation does not dissect knowledge or communicative skills, but rather fosters professional competence through a global cognitive process, which optimizes the results and justifies the full integration of simulation into the curriculum design. Authors such as McCrary and Mazur (2010) and Murphy and Cook (2020) have indicated that dialogic learning can be achieved by integrating simulations into education. Dialogue is central in classroom simulations. It leads to new understandings and new knowledge. This exploration through simulation, where pre-service teachers construct meanings through dialogue, rather than meanings being imposed from the outside, leads to powerful learning. Most importantly, learning through dialogue leads, not only to content knowledge, but also to improved language, thinking skills and intercultural awareness (Scarcella & Crookall, 1990; Woodhouse, 2011; Burke & Mancuso, 2012; Michelson & Dupuy, 2014; Ranchhod et al., 2014; Angelini & García-Carbonell, 2019). These scholars agree that simulations provide greater exposure to the target language, more purposeful interaction, more comprehensible input for learners, a reduced affective filter and lower anxiety in language learning.

Moreover, considering that simulations are inspired by reality, pre-service teachers will have had some experience of the educational challenges and the problems described in the scenario prior to the dialogues. This helps to foster the development of critical thinking skills. Starting with a logical organization of information, future teachers are subsequently encouraged to develop their creativity for finding adequate solutions to the problems presented in the scenario, to assume responsibilities to take up a role and finally to develop metacognitive abilities to reflect upon their own learning process (Angelini, 2016, 2021; Daniel et al., 2005).

Last but not least, another challenge, of which facilitators should be aware, is the development of social skills. Simulations fit well with Vygotsky's social learning theory, where students first engage in learning on a social or group level and then on an individual level. Students progress through stages, from what they can do on their own to what they can do with help and to what they are unable to do. Students cannot progress through the zones of proximal development (ZPD) without social interaction and collaboration with educators and peers (Vygotsky, 1978). During a simulation, pre-service teachers assimilate knowledge of their specific discipline and develop social skills that they may transfer to professional settings (Havnes et al., 2016; Kourgiantakis et al., 2019; Levin & Flavian, 2022; Levin & Muchnik-Rozanov, 2023).

3.4 Summary

This chapter focuses on simulation in teacher education. Simulation events constitute a forum to apply previous knowledge and practice skills, develop a broader understanding of educational issues and gain new knowledge. Simulation should be conceived as critical-dialogical pedagogy that seeks the construction of knowledge through critical reasoning, enquiry and the search for answers. Moreover, simulation through its phases facilitates opportunities to link knowledge and theory into application. Thus, Schools of Education are the ideal environment for instilling a real theoretical and practical amalgam, as opposed to a place for the rote reproduction of content.

Some Questions:

How can simulation complement teacher practices?
What benefits can be drawn from using simulation in teacher education?
When would be suitable or more recommendable to introduce simulation in teacher degrees?

References

Angelini, M. L. (2016). Integration of the pedagogical models "simulation" and "flipped classroom" in teacher instruction. *SAGE Open, 6*(1), 2158244016636430.

Angelini, M. L., & García-Carbonell, A. (2019). Developing English speaking skills through simulation-based instruction. *Teaching English with Technology, 19*(2), 3–20.

Angelini, M. L. (2021). *Learning through simulations: Ideas for educational practitioners*. Springer.

Badiee, F., & Kaufman, D. (2015). Design evaluation of a simulation for teacher education. *SAGE Open, 5*(2), 2158244015592454.

Bradley, E. G., & Kendall, B. (2014). A review of computer simulations in teacher education. *Journal of Educational Technology Systems, 43*(1), 3–12.

Brozik, D., & Zapalska, A. (2002). The Portfolio Game. *Simulation and Gaming, 33*(2), 243–256.

Brozik, D., & Zapalska, A. (2003). Experimental game: Auction! *Academy of Educational Leadership Journal, 7*(2), 93–103.

Burke, H., & Mancuso, L. (2012). Social cognitive theory, metacognition, and simulation learning in nursing education. *The Journal of Nursing Education, 51*(10), 543–548.

Crookall, D., Oxford, R., & Saunders, D. (1987). Towards a reconceptualization of simulation: From representation to reality. *Simulation/games for Learning, 17*(4), 147–171.

Crookall, D., & Thorngate, W. (2009). Acting, knowing, learning, simulating, gaming. *Simulation & Gaming, 40*(1), 8–26. https://doi.org/10.1177/1046878108330364.

Daniel, M. F., Lafortune, L., Pallascio, R., Splitter, L., Slade, C., & De La Garza, T. (2005). Modeling the development process of dialogical critical thinking in pupils aged 10 to 12 years. *Communication Education, 54*(4), 334–354.

Danielson, C. (1996). *Enhancing professional practice: A framework for teaching*. Association for Supervision and Curriculum Development.

Dotger, B. H. (2011). From know how to do now: Instructional applications of simulated interactions within teacher education. *Teacher Education and Practice, 24*(2), 132–148.

Entwhistle, N., Entwhistle, A., & Tait, H. (1993). Academic understanding and the contexts to enhance it: A perspective from research on student learning. In T. M. Duffy, J. Lowyck, & D. H. Jonassen (Eds.), *Design environments for constructive learning* (pp. 331–357). Springer-Verlag.

Ferry, B., Kervin, L., Cambourne, B., Turbill, J., Puglisi, S., Jonassen, D., & Hedberg, J. (2004, March). Online classroom simulation: The next wave for pre- service teacher education. In *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 294–302). Australian Society for Computers in Learning in Tertiary Education.

Finn, M., Phillipson, S., & Goff, W. (2020). Reflecting on diversity through a simulated practicum classroom: A case of international students. *Journal of International Students, 10*(S2), 71–85.

Fischler, R. (2007). SimTeacher.com: An online simulation tool for teacher education. *TechTrends, 51*(1), 44.

Fraser, K. L., Meguerdichian, M. J., Haws, J. T., Grant, V. J., Bajaj, K., & Cheng, A. (2018). Cognitive Load Theory for debriefing simulations: Implications for faculty development. *Advances in Simulation, 3*(1), 1–8.

García Carbonell, A., Watts Hooge, F. I., & Andreu Andrés, M. A. (2012). Simulación telemática como experiencia de aprendizaje de la lengua inglesa. *REDU: Revista de docencia universitaria, 10*(3), 301–323.

Gibson, D. C., Knezek, G., Redmond, P., & Bradley, E. (2014). *Handbook of games and simulations in teacher education*. Association for the Advancement of Computing in Education (AACE).

Grossman, P. (2009). Research on pedagogical approaches in teacher education. In *Studying teacher education* (pp. 437–488). Routledge.

Havnes, A., Christiansen, B., Bjørk, I. T., & Hessevaagbakke, E. (2016). Peer learning in higher education: Patterns of talk and interaction in skills centre simulation. *Learning, Culture and Social Interaction, 8*, 75–87.

Hoban, G. F. (2002). *Teacher learning for educational change*. Open University Press.

Jones, K. (2013). *Simulations: A Handbook for Teachers and Trainers*. Routledge.

Kervin, L., & Turbill, J. (2003). Teaching as a craft: Making links between pre-service training and classroom practice. *English Teaching: Practice and Critique, 2*(3), 22–34.

Klabbers, J. H. (2009). *The magic circle: Principles of gaming and simulation*. Sense Publishers.

Kohli, R., Picower, B., Martinez, A. N., & Ortiz, N. (2015). Critical professional development: Centering the social justice needs of teachers. *The International Journal of Critical Pedagogy, 6*(2).

Kolbe, M., Grande, B., & Spahn, D. R. (2015). Briefing and debriefing during simulation-based training and beyond: Content, structure, attitude and setting. *Best Practice & Research Clinical Anaesthesiology, 29*(1), 87–96.

Kourgiantakis, T., Bogo, M., & Sewell, K. M. (2019). Practice fridays: Using simulation to develop holistic competence. *Journal of Social Work Education, 55*(3), 551–564.

La Paro, K. M., Van Schagen, A., King, E., & Lippard, C. (2018). A systems perspective on practicum experiences in early childhood teacher education: Focus on interprofessional relationships. *Early Childhood Education Journal, 46*(4), 365–375.

Larsen, M. A., & Searle, M. J. (2017). International service learning and critical global citizenship: A cross-case study of a Canadian teacher education alternative practicum. *Teaching and Teacher Education, 63*, 196–205.

Levin, O., & Flavian, H. (2022). Simulation-based learning in the context of peer learning from the perspective of preservice teachers: A case study. *European Journal of Teacher Education*, *45*(3), 373–394.

Levin, O., & Muchnik-Rozanov, Y. (2023). Professional development during simulation-based learning: Experiences and insights of preservice teachers. *Journal of Education for Teaching*, *49*(1), 120–136.

McCrary, N. E., & Mazur, J. M. (2010). Conceptualizing a narrative simulation to promote dialogic reflection: Using a multiple outcome design to engage teacher mentors. *Educational Technology Research and Development, 58*(3), 325–342.
McGarr, O. (2021). The use of virtual simulations in teacher education to develop pre- service teachers' behaviour and classroom management skills: Implications for reflective practice. *Journal of Education for Teaching, 47*(2), 274–286.
Michelson, K., & Dupuy, B. (2014). Multi-storied lives: Global simulation as an approach to developing multiliteracies in an intermediate French course. *L2 Journal, 6*(1), 21–49.
Mukhtar, M. A., Hasim, Z., & Yunus, M. M. (2018). The efficacy of simulated teaching in preparing pre-service teachers for practicum. *Journal of Nusantara Studies (JONUS), 3*(1), 64–74.
Murphy, K. M., & Cook, A. L. (2020). Mixed reality simulations: A next generation digital tool to support social-emotional learning. In *Next generation digital tools and applications for teaching and learning enhancement* (pp. 1–15). IGI Global.
Ranchhod, A., Gurău, C., Loukis, E., & Trivedi, R. (2014). Evaluating the educational effectiveness of simulation games: A value generation model. *Information Sciences, 264*(1), 75–90.
Sasaki, R., Goff, W., Dowsett, A., Paroissien, D., Matthies, J., Di Iorio, C., & Puddy, G. (2020). The practicum experience during Covid-19–Supporting pre-service teachers practicum experience through a simulated classroom. *Journal of Technology and Teacher Education, 28*(2), 329–339.
Scarcella, R., & Crookall, D. (1990). Simulation/gaming and language acquisition. *Simulation, gaming, and language learning* (pp. 223–230).
Sjølie, E., & Østern, A. L. (2021). Student teachers' criticism of teacher education–through the lens of practice architectures. *Pedagogy, Culture & Society, 29*(2), 263–280.
Speed, S. A., Bradley, E., & Garland, K. V. (2015). Teaching adult learner characteristics and facilitation strategies through simulation-based practice. *Journal of Educational Technology Systems, 44*(2), 203–229.
Stronge, J. H. (2002). *Qualities of effective teachers*. Association for Supervision and Curriculum Development.
Thompson, G. H., & Dass, P. (2000). Improving students' self-efficacy in strategic management: The relative impact of cases and simulations. *Simulation & Gaming, 31*(1), 22–41.
Vygotsky, L. (1978). *Mind in society*. Harvard University Press.
Woodhouse, T. (2011). Thai university students' perceptions of simulation for language education. http://www.thaisim.org/ts2011/docs/TS11_prog-book_f.pdf.

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4

Facilitation Interventions to Increase Learning Effectiveness in Game Simulations. A Generic Approach of Facilitation Applicable to a Broad Variety of Simulation Games

Marieke de Wijse-van Heeswijk

Overview

Conditions for learning from simulation games (SG) are manyfold; facilitation can serve as a leverage point to increase learning effectiveness. Momentarily facilitators have no (theoretical) frame of reference regarding what the rationale is for interventions in relation to (1) what type of interventions is used; (2) what types of interventions are aimed at what type of learning; and (3) what facilitation options are in relation to contextual challenges. In this chapter, we focus on two factors; factor one adds to the skill level of participants and factor two brings focus to learning processes by optimizing cognitive load conditions which are extraneous cognitive load (ECL) and germane cognitive load (GCL). ECL diverts attention from learning while GCL focuses attention toward learning. The skill level of participants can be enhanced by facilitated interventions aimed at reducing ECL and enhancing GCL, for instance, by designing additional reflection in time outs. In the time outs, participants reflect on open questions that guide reflection regarding what went well and not so well in relation to their learning goals. The fact participants take time to reflect allows them to learn more from feedback. In addition, the facilitator can coach on feedback, cooperation, and decision making skills that serve as leverage points to skills necessary for achieving learning goals. For instance, if a participant lacks decision making skills, few decisions are made, less feedback is received, and limited learning opportunities arise. This summary shows how important the role of the facilitator can be in optimizing learning from SGs.

Keywords

Facilitation · Intervention · Learning effectiveness · Debriefing · Reflection · Instructional design · Rule-based simulation games · Open simulation games

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Learning Objectives

- Develop a meta perspective on facilitated intervention and what can be achieved with them.
- Discern two types of meta interventions (directed toward reducing ECL and enhancement of skills that contribute to learning in any type of SGs).
- Have knowledge on the existence of a continuum rule-based open SGs and that any type of simulation game can be situated on this continuum in relation to how this renders different challenges for facilitation.
- Obtain knowledge on how rule-based SGs render a different learning result from open SGs and why, so choices can be made on what type of SG to use with what learning objective.
- Design a contextualized facilitation approach for both types of SGs and all in between with a broad set of interventions displayed in this chapter.

4.1 Introduction

The facilitator of SGs can increase learning effects via interventions before, during and after the gameplay (Alklind Taylor, 2014; de Wijse-van Heeswijk, 2021; Leigh et al., 2021; van Laere et al., 2021). Unfacilitated games render a lower learning outcome as opposed to facilitated gaming sessions (Kirschner, 2006). Nakamura (2021) researched the effects of a decomplexifying strategy using guided questions in a rule-based simulation game and found that if participants prepare before gameplay with structured questions, a positive effect on the learning and outcomes of the SGs occurs. Participants had a deeper understanding and enhanced argumentation for the strategies developed in the SG. Also, their performance in the game was on average higher as opposed to sessions without guided questions. This research opens the path to gain insight into how facilitation can enhance learning in SGs. Facilitation can be conceptualized as activities a facilitator can predesign or facilitation during gameplay and reflection aimed at enhancing learning from the simulation game. In SGs, all involved can learn about what happens during the gameplay and reflections, including facilitators and possibly researchers. It is not just a learning opportunity for participants. Since simulation games are complex social systems (Bekebrede et al., 2015; Raghothama, 2017), variations in behavior can cause different learning outcomes to occur possibly deviated from the intended learning outcomes. Deviation from intended learning outcomes may even render more interesting results because these emerge from the group and point to what is relevant for them. Facilitation (design) in SGs has been researched scarcely (Alklind Taylor, 2014; de Wijse-van Heeswijk, 2021; Leigh et al., 2021; Lukosch et al., 2018). Currently, there are extensive research gaps concerning what type of interventions deliver what effects under which conditions and when to perform

what intervention in what frequency. Some research on how to approach interventions to capture learning via reflection tools and questionnaires in SGs was developed by several authors in the game and simulation field (Hense et al., 2009; Kriz & Auchter, 2016; van Laere & Lindblom, 2019; and Nakamura, 2021). Cognitive load is a relevant theme for this research because participants are subject to three different kinds of cognitive load in SGs (Fraser et al., 2018; Gonzalez, 2005; Kalyuga & Singh, 2016; Leppink, 2017). First, there is internal cognitive load (ICL) relating to the distractions participants experience from personal factors such as the level of experienced stress. The second form is extraneous cognitive load (ECL), which concerns the stimuli from the game environment that distract participants from learning (Lee et al., 2020). The third type is germane cognitive load (GCL) which consists of the cognitive capacity participant can use for their learning processes (Gonzalez, 2005). In the field of medical SGs, the influence of a time out option chosen by the participants was researched in its relation to cognitive load and learning from the game (Lee et al., 2020). The results indicated the agency effect experienced by the participant might explain the positive relation between the time outs and learning from the simulation game because the researchers could not establish a direct relation between ECL reduction and the time out. As a possible explanation for the lack of support for a direct relation, the researchers point to the fact that they did not pre-structure the time out with guided questions for reflections which led them to hypothesize there was no additional learning and cognitive load reduction taking place in the time out. This is confirmed in the study by Nakamura (2021) in which pre-structured questions added value to the learning effect of the simulation game. Tosterud et al. (2020) found that following the Steinwachs debriefing with structured questions 'what happened', 'why did this happen', and 'what does this mean for reality' (descriptive phase, analysis phase, and application phase) did not reach the best learning result with students. Cheng et al. (2016) propose to design debriefing around the learner's perceptions. Some studies such as Husebø et al. (2013) researched the effects of debriefing questions on reflection with participants in medical SGs and found a positive (qualitative) result and suggest further research is necessary on the types of questions asked and their effects on learning. We do not know if these results are generalizable to all SGs, since medical SGs have specific contexts and tend to be rule based such as having strict norms on what behavior is correct and not according to pre-specified procedures.

Since research on the impact of interventions is mainly absent in simulation gaming it is worth investigating sources on the effects of interventions on learning from other disciplines. Some research was conducted regarding the effects of change interventions on learning in organizational change contexts (Argyris, 1970; Argyris, 2002; Edmondson & Moingeon, 1998; Edmondson, 1996; Lambrechts et al., 2009; Nielsen & Abildgaard, 2013). Achterbergh and Vriens (2019) performed a theoretical study into the design of episodic organizational change interventions. Berta (2015) studied how facilitation can contribute to organizational learning from a theoretical perspective. A substantial knowledge gap exists on the effects of specific types of interventions on specific types of (organizational) learning (Amy, 2008; Baard, 2010; Baard & Dumay, 2020; Berta et al., 2015)

during change and organizational learning processes. Nielsen and Miraglia (2017) argue for a contextualized approach regarding the evaluation of interventions in organizational change.

In other research fields such as behavioral operational research (Franco et al., 2020), research on team cooperation, (Kolfschoten et al., 2007; Lee et al., 2020; Rouwette et al., 2002; Tjosvold et al., 2004; Van Merrienboer & Sweller, 2005), and system dynamics and group model building that consists of a participatory modeling process for resolving complex and messy problems (Rouwette et al., 2002; Scott et al., 2016; Sterman et al., 2018; Vennix, 1999), more specific research on the impact of facilitated interventions as in timing and type of intervention has been conducted (Khalifa et al., 2002; Kwok et al., 2002; Lapalme & Conklin, 2015; Limayem & DeSanctis, 2000; Tan et al., 1999; Wollersheim et al., 2016). Researchers in this field mainly conclude that paying attention to process interventions can optimize conditions for effective and qualitative decision making. Some findings point out there is a maximum of interventions toward optimizing the process of decision making because the group did not show higher performance after two interventions.

No research has been conducted to see if these results are transferable to learning in SGs. Learning and decision making are connected but are not necessarily the same thing. Also, in group decision making, it is a common practice to work with scripts (programming short protocols on what intervention and procedure to perform when), and groups are not exposed to a simulated environment which means that between this type of research and SGs there are large differences in the circumstances. Research from instructional design in (SGs) education can potentially aid in gaining insight into what facilitated (pre-designed) interventions add value (Hattie et al., 1996; Marzano et al., 2001; Paas et al., 2003; Sweller, 2020). However, SGs have unique properties as the fact that they are social systems in action, and learning in SGs is often aimed at developing skills that go beyond applying protocols and developing content knowledge. The traditional approaches to learning in general education might not apply to the context of SGs in which participants are submerged in a simulated environment. More specific research in the field of gaming is necessary to find out if parallels can be drawn between instructional design in general and the design of SGs.

4.1.1 Challenges in Researching Interventions

To research the effects of facilitated interventions is challenging because of multiple factors and specific conditions (Baard, 2010; DeSanctis & Poole, 1994; Dumay & Baard, 2017; Hazy & Uhl-Bien, 2015; Marion & Uhl-Bien, 2007; Tsoukas, 2017; Uhl-Bien & Arena, 2018; Visser et al., 2018). Hense et al. (2009) and Kriz and Auchter (2016) conducted a series of studies about the effects of different facilitation approaches (male or female facilitator, less emphasis on numerical indicators, and emphasis on winning versus process learnings) on learning in gameplay.

Some studies aimed at creating safe learning environments (Carrera et al., 2016; de Wijse-van Heeswijk, 2021; Dieckmann, 2020; Jones, 1998; Kato, 2010; Rudolph et al., 2013; Rudolph et al., 2007), other studies oriented toward how different SGs require different facilitation approaches (Leigh, 2003a; Leigh & Spindler, 2004; Leigh & Spindler, 2005), and the coaching by gaming framework based on Kolb's experiential learning was developed by Alklind Taylor (2014). Until now no specific research is performed into facilitated interventions aimed at skill development with participants to enhance their skills to learn from SGs. Also, the role of the facilitator in reducing ECL has been understudied. We seek to develop theory on a meta level to find recommendations for the facilitation of SGs aimed at development (such as reflection, providing feedback, decision making skills, and cooperative skills) and reduction of ECL while increasing GCL that are valid for different contexts. An example of facilitated interventions on a meta level is for example; a facilitator can support learning safety via pre-structured questions that are aimed at how the group and the facilitator should enhance and support safe learning in this specific simulation game. The facilitator can initiate a general discussion on what is needed from the facilitator, the participants, and other factors in the context to create a fruitful learning environment. In this discussion, the facilitator can also share that learning in simulation games is about learning from feedback, and making mistakes is part of experiential learning. Making sure participants understand that learning from feedback is powerful (Cook et al., 2012) further enhances agency and acceptance of challenges in the gameplay.

4.2 Types of SGs and the Relation to Facilitation of Learning

First, it is relevant to discuss different types of SGs on the continuum of open and closed SGs because the literature prescribes these require different facilitation approaches (Klabbers, 2009; Leigh & Spindler, 2005). In rule-based SGs, actions are taken based on rules, and a facilitator should be a referee (Klabbers, 2009, in (Kriz & Duke, 2014) conference presentation) checking if rules are followed by participants. A rule-based simulation game presupposes a predictable world presupposing learning goals can be determined ahead and designed into the rules and procedures of a game (Klabbers, 2009; Leigh & Spindler, 2004). Rule-based simulation games are often used in the medical context, aviation, and the military because of rules and procedures that need to be trained and practiced. Also, mixed forms of games with both rule-based and open elements (situated somewhere on the continuum) exist, for instance, when in addition to a procedure one also has to learn about higher order skills such as situational awareness, crisis management skills, or systems competence (skills one needs to act in complex changing social environments). Rule-based games exist based on pre-determined norms on what is good and what is the wrong kind of behavior, and they function more as assessment. The game and/or facilitator provides feedback on how the participant performs according to a pre-specified norm.

This assumes a predictable world with often a few best solutions. This assumption does not hold for all types of learning, for example, learning to learn and deal with ambiguity or learning to adapt processes and procedures to new circumstances, for these types of learning a rule based sg is not suitable a rule-based simulation generally provides pre-specified feedback according to procedures and therefore is not fit for higher order learning skills specifically.

The opposite side of the continuum are the open SGs. Open SGs are often used for (organizational) development and/or policy gaming (Duke, 2014; Klabbers, 2009) because they provide a learning environment for dealing with uncertainty and messy problems. This type of SGs is aimed at fostering higher order skills such as third-order learning. Other terms used for this type of learning or that are close to this term are deutero learning, meta cognition, systems competence, and transformational learning (Elkjaer, 2004; Tosey et al., 2012). This terminology includes learning to learn as in learning to adapt to new challenges that may be changing continuously; see Kriz in (Schwägele et al., 2012) on systemkompetenz. These types of skills are relevant in this age of increasing speed of change and at the same time the increasing globalization and complexity of influences (Hazy & Uhl-Bien, 2015; Senge & Sterman, 1992; Uhl-Bien & Arena, 2017). In an open simulation only the most essential elements are designed so there is space for the interpretations of the participants to shape and give meaning to the simulation environment, which increases realism and agency (Deen, 2015; Harteveld, 2011; Watt & Smith, 2021). The way the participants start working together shapes the structure of the simulation game. In addition, the feedback from the game mechanics, the interaction between participants and the role of the facilitator should act as a mirror to the participants allowing for reflection and learning (Gugerell & Zuidema, 2017; Harteveld, 2011; Klabbers, 2009; Ren, 2018). Because of the openness of this type of SGs seemingly an unlimited array of possible behaviors as well as generation of feedback can occur. However, this array of optional behavior is restricted by first the frames of reference of the participants, secondly by the scenario, and third actions of the facilitator that can steer the behavior of participants in the direction of learning goals. For instance, if a participant suggests a merger, and this is not aligned with the learning goals, the facilitator can prohibit this option via a realistic event distracting attention from the merger option, for instance, an internal organizational crisis.

The feedback in a (more) open simulation game can be more diverse than just the information on deviating from expected behavior that is provided in rule-based simulations. Due to more autonomy with participants, they can also determine their own learning paths, and then the feedback participants receive is more personalized. Participants can receive feedback from many different sources and they also can influence how often they get feedback and what type of feedback this will be. The learning conditions in open simulation games provide more opportunities for learning and also for second-order (process learning) and third-order learning (learning to learn, adjusting your role to changing circumstances) because of the previous explanations. In open SGs, a facilitator is necessary as an observer and feedback provider, and he or she can stand on the rim of the gameplay and the outside world (de Wijse-van Heeswijk, 2021). The facilitator can function as part of

the game and respond adaptively to the learnings and developments that take place in 'the magic circle' of gameplay (Klabbers, 2009). The facilitator plays an essential role in shaping the simulation game into a didactically sound learning environment that moves along with the challenges participants raise for themselves. A facilitator has a role in guarding a safe learning environment (Carrera et al., 2016; De Ronde, 2015; Dieckmann et al., 2009; Jones, 1998; Kato, 2010). He or she can stop the game if it seems necessary to either reflect or in the worst case stop developments from escalating. In addition, a facilitator is necessary because people may have personal biases possible enlarged by organization (sub)culture and may lack skills for cooperation, providing functional feedback and contributing to group decision making processes that add to the quality of the final decision (Heron, 1993; Kolfschoten et al., 2004; Vennix, 1990). Lacerenza et al. (2018) studied what skills contribute to team building and team effectivity in real life and what interventions contribute to this skill development on a meta level. She identifies different sets of competencies that resemble skills participants need in SGs, such as decision making skills, communicative skills, conflict resolution, and leadership skills. Since SGs consist of abstraction models, not all findings are one on one transferrable to other SGs. It is dependent on the type of SGs.

In rule-based SGs, a facilitator often needs to direct interventions at understanding the game, the rules, procedures, the roles, and the terminology used. In case the simulation environment does not match the normal work practice of participants (see scope and distance discussion in de Wijse-van Heeswijk, 2021), a facilitator needs to clarify content such as terminology and procedures so the players can play and learn from the game as intended. In addition, the games internal structure can cause dysfunctional disturbances in itself. Achterbergh and Vriens describe De Sitters' socio technique and the parameter indicators to determine the complexity and disturbance sensitivity of a particular structure (Achterbergh & Vriens, 2010; Sitter, 1981; Vriens et al., 2018). High scores on the parameters lead to structures that impede learning. An example: high task division in functionality (e.g., production task, preparation task, and supportive task) in combination with high task interdependency can cause delays in receiving and dealing adequately with feedback and impede learning. If the external cognitive load from these disturbances is not adding to learning from the game, the game either has to be redesigned and/or the facilitator has to attend to optimizing learning conditions.

4.3 Optimizing Learning in any Type of Simulation Game

On any place on the continuum, rule-based open - simulation game learning is required. Conditions for learning are fairly generic over different contexts as is confirmed by the array of literature on game design advising to build in autonomy for scaffolding and agency, receiving regular feedback, time for reflection, providing challenging conditions, etc. (Bedwell et al., 2012; Faria et al., 2008; Tieben, 2015; Watt & Smith, 2021). First, one has to have the opportunity to learn and not

be overloaded by stimuli that distract too much from learning. Secondly, one needs to have or develop a certain skill level to deal with the simulation game environment.

The facilitator has at least two possible options for optimizing learning conditions for any type of simulation game:

1. Increasing GCL and reducing ECL (attenuation; see explanation below).
2. Enhancing the skill level via adding reflection and usage of feedback (amplification; see explanation below).

From a systems point of view, Ashby's law of requisite variety (Achterbergh & Vriens, 2010; Raadt, 1987; Tsoukas, 2017) explains why these two types of interventions make sense. Ashby's law prescribes that a system has to attend to the variety in its surrounding in such a way it can survive. Two strategies are available, strategy I is *amplification* meaning incorporating variety from its surroundings, so it can deliver an adequate response via variety absorption (meaning the problem is solved internally and the social system then has enough options to form an adequate response). Strategy II is *attenuation*; this is a form of reduction of variety that in SGs can bring focus to the learning goals. An example of attenuation; the participants ask the facilitator if there are any rules regarding cooperation in the game. The facilitator replies 'only the rules you see fit!' (within ethical constraints see De Wijse, 2021) and the facilitator himself refrains from imposing rules. First participants make a long list of rules of engagement in cooperation to find out later if these rules don't replace trust. In this example, the facilitator has added possibilities by having participants make up their own rules; this added to GCL because participants realized that having rules did not replace the trust needed for sustainable cooperation. Here follow some further examples to explain the relevance of attenuation and amplifications that are build into interventions of facilitators and hence support learning in SGs.

An example of amplification: participants postpone decisions because of inadequate meetings. The facilitator intervenes and explains if you do not make decisions and evaluate your decisions in a joint meeting you will go bankrupt soon. The participants plan for meetings and make a meeting agenda. Next game round they made decisions and reflected on the outcome of the decisions in the joint meeting so next round they obtain new information on the effects of their strategy. The intervention of the facilitator contributed to the feedback on the learning of participants and provided them with information on what worked and what didn't. Via changing their behavior they learned a more optimal way of deciding and cooperating while at the same time they make more use of the SGs possibilities.

An example combining attenuation and amplification in one intervention: a participant wants more information on a certain aspect of the simulation game. The facilitator estimates this information does not add to the learning goals of the participant. The facilitator adds a reflection time out having participants reflect on their learning goals. The participant realizes more information is not actually needed to achieve the learning goals and does not request more information. This intervention reduces ECL and enhances GCL.

4.3.1 Cybernetics and Social Systems Theory to Analyze What Type of Intervention is Needed

SGs are complex social systems that can generate an abundance of complexity that aids but also potentially impedes learning. SGs are a specific system, namely a socio-technical system, in which the 'technology' or structure of the SGs interacts with the actors playing in the system (Bekebrede et al., 2015; Raghothama, 2017). Giddens refers to this as the duality of structure in which actors and systems mutually influence each other and generate unique outcomes (Fuchs, 2002; Klabbers, 2009; Sewell, 1992). For any system to survive, adaptation (read 'learning') is needed because the system needs to obtain enough resources in return from its environment, the system also must deliver sufficient added value to the environment, or the organization is terminated. Here, we add further theoretical explanations on how the two strategies attenuation and amplification can be applied and add value to facilitation and the learning outcomes in SGs.

I. ***The reduction of variety (strategy I attenuation) by focusing individuals on their learning goals***

   In SGs as social system so much variety is generated it can become difficult for participants to see 'the path through the forest'. For example, adding reflective questions in time outs provides opportunity to take time to learn and incorporate learnings in future action planning aimed at learning goals.

II. ***To amplify certain variety (strategy II amplification) in the form of skills attached to the learning objectives of the simulation game***

   In addition to certain skills such as communicative skills, feedback skills, decision making, and meeting skills, the development of higher order skills such as third-order learning, meta cognitive skills, and systems competence of the participants can contribute to learning to learn. Learning to learn is important because it allows participants to adapt to new situations. Higher order skills enable participants to identify what is needed in a given situation and how participants can add value from their roles also from an ethical and sustainable point of view. Providing first the insight and then the opportunity to experiment and learn can serve as a leverage point for acquiring these skills. If certain skill levels are underdeveloped, a facilitator can provide opportunities to enhance these skills in the SG. For instance, if decision making and cooperation skills are low, this can impede learning on other (higher) goals such as developing strategic management skills. A facilitator can pre-structure meetings in the simulation game to enhance decision making qualities. If participants experience the outcome of a new behavioral approach and how this renders result on decision making in the process, participants are more likely to incorporate this as a learning process. Participants in decision making. Skills in decision making are especially important in SGs because in the simulation model feedback is provided based on decisions that are taken otherwise every simulation turns into a crisis situation. As an example, Vennix (1999) proposes in group model

building (which is a participatory modeling process aimed at complex decision making) to assign roles to certain content and process features (a time keeper, a chair, a quality of content manager, etc.) which reduce the variety and hence support cooperation. This paves the way to advance learning to higher order skills because now these are not impeded by other dynamics in the gameplay and in the interaction between the participants.

Amplification here can be seen as skill development, so types of responses and variety within can be increased with individuals so they are more fit to respond adequately to variety in their environment. The model below illustrates the process (Fig. 4.1).

It is possible an intervention has both an attenuated and amplification effect. Human interaction is complex and multi-layered, and the same goes for the interventions of facilitators. While a facilitator can bring focus with a question (attenuation), it may at the same time open up windows of opportunities for participants to deal with a given challenge (amplification).

4.3.2 Potential Learning Impediments from Within the Simulation Game

Here, we describe common impediments for learning in SGs, and these can stem from

1. the games structure;
2. the culture;
3. expectancies participants bring into the gameplay (Caluwé et al., 2001; Klabbers, 2009).

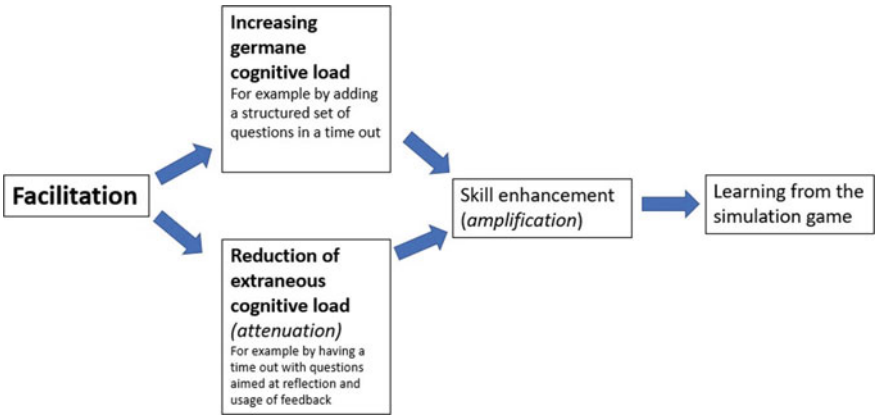

Fig. 4.1 Conceptual model on facilitation and learning

At the same time, these impediments are sources for learning. Expectancies can be mirrored in the feedback from the gameplay for participants to reflect on, the game structure can resemble the organizations participants are part of, and the culture participants bring into the gameplay shapes the learning opportunities. All three are sources for learning as well as impediments. If facilitators gain insight into these factors, they can be used as a leverage point for learning. Every problem also potentially creates a useful challenge, a perfect game would be very boring and would probably not even be characterized as a SG but an assessment.

4.3.2.1 Internal Structure of the Simulation Game as Potential Learning Impediment

For facilitators, it is crucial to understand what is enabling or impeding learning in the gameplay. Literature on socio-technical organization design can serve as a useful background to understand how an organization or SGs game structure can enhance or impede learning (Achterbergh & Vriens, 2010; de Wijse-van Heeswijk, 2021; Sitter, 1981). Simulation games have their own structure representing the abstraction model base on which the game was created (Duke, 2014). For example, bureaucratic structures (with high task division and extensive interdependency of functions) tend to cause a lack of overview since organizational members have limited autonomy to solve or anticipate problems. In practice, this causes demotivation and just 'pushing problems forward' behavior. In rule-based SGs, the effects of rules can be demonstrated and learned from. For instance, a facilitator can intervene and allow for change or amendment of certain rules for participants to learn about the effects of these changes in a functional way by reflecting, for instance, in time outs on differences that occurred. In addition, it is helpful for participants to know what factors are personal or group specific and what factors relate to the organizations structure. If the sources of problems can be discerned, this provides an opportunity for learning. Also because of the internal complexity generated by SGs as socio-technical systems learners can learn less than optimal from SGs, (Bekebrede et al., 2015; Klabbers, 2009; Lukosch et al., 2018) then the interventions of a facilitator are necessary to optimize learning.

4.3.2.2 Expectancies, Culture, and Bias as Learning Opportunity and Impediment

For learning, it can be useful to be confronted with the existence of expectancies (albeit in the form of culture) (Bogost, 2008; Brown & Vaughan, 2009; Sutton-Smith, 2009) and the effects of biases. Organizations and personal culture are hidden in expectancies, values, and beliefs (Bateson, 1991; Schein, 1990; Tosey, 2006). In addition, in practice thinking and doing are loosely coupled and not always consistent (Weick & Quinn, 1999; Weick et al., 2005). In SGs, this can become explicit so participants can actively reflect on the pros and cons of certain assumptions, biases, etc. A facilitator needs to make explicit what hidden assumptions and biases might impede learning so participants are provided the opportunity to investigate the effects of their biases and the specific (cultural) expectations they bring into the gameplay. For example, if participants are not used

to an active way of learning, they might be passive in the simulation game and receive limited feedback on their functioning. A facilitator then needs to intervene to make participants aware of their impeding norms and open up new perspectives. At the same time, a facilitator needs to be aware of his or her own assumptions and biases and be part of the learning process (de Wijse-van Heeswijk, 2021; Dieckmann et al., 2009; Leigh, 2003b).

4.3.3 On Designing Learning Loops with Pre-structured Questions and Stimuli

From a cybernetics point of view, the facilitator can reduce extraneous load (in cybernetic terminology unnecessary variety reduction is named *attenuation*) to increase GCL (in cybernetic terminology this is *amplification* and system-relevant variety enlargement) via the use of learning loops. We explain how this is possible from theoretical perspectives in learning and cybernetics. The idea of learning loops originates from Argyris (Argyris & Schön, 1996; Argyris et al., 1997). He identified two different kinds of learning loops; first-order learning meaning content or procedural learning so the learner learns when to apply what norms. Second-order learning contains learning about processes, what processes are functional, and when to apply these processes. Second-order learning is about the value behind the norms. Triple loop learning was later added (Reynolds, 2014; Tosey et al., 2012). Other authors sometimes use different terminology such as deutero learning (Visser, 2004) to represent the processes behind the creation of values, to address why are we doing this, and if the doing is done for the right reasons in a philosophical sense (Achterbergh & Vriens, 2010). Often learning goals for gaming are aimed at second- and third-order learning because SGs provide participants with an environment in the form of a micro-organization that can challenge their assumptions and values potentially leading to behavioral change (Gugerell & Zuidema, 2017), for instance, in an organizational culture development program. Kolb (Alklind Taylor et al., 2012; Kolb & Kolb, 2009) developed a learning theory on what specific phases a learning process should contain, and he identified four phases of action learning:

I. Phase active experimentation;
II. Phase concrete experience;
III. Phase reflective observation;
IV. Phase abstract conceptualization (Fig. 4.2).

The phases are intentionally not numbered since in practice phases can follow in different orders and some phases may even be absent or implicitly present in unconscious learning processes. Not all four phases must be addressed before learning takes place (Kolb & Kolb, 2008). The four phases fit seamlessly into the practice of simulation gaming in which participants usually plan, perform actions, reflect, and conceptualize their learnings in gameplay and reflection phases that take place within an evolving scenario (Alklind Taylor, 2014; Kolb & Kolb, 2009). Both Kolb and Argyris make use of the gap between actual performance and the

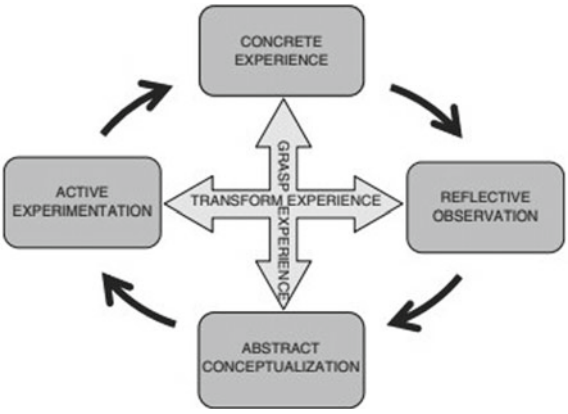

Fig. 4.2 Learning cycle by Kolb & Kolb in the learning way (2009)

performance aimed for. Vennix (1990) summarized critique on Kolb's experiential learning cycle because of the explicit statement made by Kolb that learning takes place based on experience as if this is the only proven way to learn.

Kayes (2002), in a review study on criticism toward Kolb's experiential learning theory, states that the criticism is largely due to Kolb not paying attention to learning in the context of organizations. In later work, Kolb et al. (1984) argue how the learning cycle relates to the criticism and explain the social and cultural linkages on experimental learning in organizations. An important point of criticism in Kolb's theory that is mentioned in Kayes (2002) is that it assumes all learning can be explicated leaving out tacit or unconscious learning. I confirm it is not possible to look inside the heads of people, and when individuals add words to explain their learnings, they are potentially biased (Ellis, 2018; Hubbard, 2018). However, the experiential learning model fits closely to the learning cycles taking place in SGs, in which reflective observation on action takes place and participants usually plan and conceptualize their learnings in their action plans and written or explicit statements (Kolb et al., 2014). Empirical research confirms the validity of Kolb's experiential cycle and confirms the presence of all four phases in the measured learning context (Geiger et al., 1992; Loo, 1999; Willcoxson & Prosser, 1996; Yahya, 1998). However, Vennix (1990) also found several studies that at least partly disconfirm the validity of the learning styles because of the high unexplained variety in the studies supposing there is more complexity in the form of mediating and moderating variables present.

4.3.3.1 Learning Loops in Relation to Attenuation and Amplification

The experiential learning cycle can be defined as a learning loop and now we explain how learning loops can simultaneously increase GCL and decrease ECL and at the same time develop skills with participants via Ashby's law of requisite variety via amplification and attenuation. This may appear as a complex activity while that does not necessarily have to be the case. In practice, learning loops naturally flow from repeated interventions concerning amplification and

attenuation, for instance, in reflection time outs and interventions during gameplay using feedback and stimuli. The learning cycle of Kolb was related to learning in SGs by several authors (Alklind Taylor, 2014; Hamdaoui et al., 2018; Herz & Merz, 1998; Kolb & Kolb, 2008; Schmutz et al., 2018). The facilitator has a role in all four phases, from the active experimentation phase by providing the feedback on the actions of the participants so they can analyze, learn, and reflect in the following phases. These experimental learning cycles can take place throughout the gameplay, but also the facilitator can add extra learning loops, for instance, in a time out in between game rounds so the learnings from the experimentation can be optimized.

With multiple structured (with questions for learning and reflection) and timed learning loops, learning processes are optimized because unnecessary variety is reduced. How this can appear in practice is described in the following case study section. A facilitator can generate multiple learning loops via facilitation (beforehand) and facilitation at the moment (during gameplay, reflection/debriefing). Especially adding reflection if participants are tempted to leave it out. Reflection seems to play an essential part in (organizational) learning (Argyris, 2004; Ellis et al., 2014; Geithner & Menzel, 2016; Knipfer et al., 2013; Zundel, 2013).

Designing learning loops can be applied from a meta to a macro and a micro level via facilitation. Wollersheim et al. (2016) found adding three learning interventions optimized learning, and more interventions did not render a larger learning result. An example of a meta learning loop here may provide more clarification; a facilitator that prepares the participants for the well-known valley of despair (Lauer & Crimson, 1972; Wenzler & Chartier, 1999). The facilitator tells participants that during gameplay they can encounter a phase of frustration and that this is a natural thing to happen in SGs. The facilitator explains learning in this phase can sometimes emotionally difficult, while at the same time it also forms a basis for third-order learning. Working through this phase participants can move beyond what they were already capable of and apply new skills. When participants encounter this valley of despair, they might feel more prepared to deal with the challenges and difficulties associated with this and consciously and deliberately reflect on it during the gameplay and/or in a time out reflection.

An example of a macro intervention generating a learning loop is having participants prepare in a phase zero to form strategies and plans with their role groups to achieve their goals in the simulation and their personal learning goals together. After some playing time, the facilitator can implement a time out and have participants reflect on their plans made in phase zero with structured questions and see what is needed to achieve those goals from themselves and from others. This way participants are prepared and they need to reflect and have time to reflect in time outs with the guidance of the facilitator and structured questions after which they can form new plans and actively experiment again.

An example of a micro intervention during gameplay facilitation is asking a specific participant to step out of the gameplay and observe for a while. In a case study (Community case study from 2015 PhD research author), a participant experienced a lot of frustration because the meeting process was very chaotic, and

decision making quality suffered from this. Therefore he went to the facilitator to talk on a solution. The facilitator deliberated with the participant that it was no use to stay part of the process and that it might be better to take on an observing role because this participant was feeling very frustrated and emotional. After a while, the facilitator came back and asked the participant what he observed while being out of the gameplay. The participant concluded, 'the group wanted me back into the game as process guider'. After a short deliberation with the facilitator, both concluded it was good to have a short break to reduce frustration and have the group experience the added value of the participant that stepped out. When returning back into the group, there was less frustration because the group listened and applied the process guidance of the process leading participant. The participant learned that working harder delivered even more frustration. Stepping back rendered a greater impact. The group learned the added value of process management and that a person who takes on the role of process facilitator is sometimes necessary to obtain cooperation and make decisions.

4.4 Individual/Group and Simulation Game (Organization) Level Interventions to Reduce Complexity and Increase GCL by Facilitators

Facilitators can perform a variety of interventions on different levels to stimulate learning processes in SGs (de Wijse-van Heeswijk, 2021; Taylor, 2015; van Laere & Lindblom, 2019; van Laere et al., 2021). If a facilitator predesigns (prepares for the game play starts) the time outs in such a way the same questions '*what went well, not so well and what do you need from yourself and from others to improve*' after each game round this is a way to weave a red tread of relevant learnings. If a facilitator first has individuals reflect on these questions and then share their learnings in their (role) group/team, this then should be followed by a plenary session for all participants in which all participants and their teams gather from this cascade model of individual to group to 'organization' level reflection. Learnings can be extracted from the different teams and can become more sharpened, embedded in the stories and experiences of participants, and translated through to simulation game (organizational) level in which the learning should anchor. It makes sense to intervene on all three levels of learning from individual to group to simulation game (organizational) learning because these levels are all interconnected and relevant findings are filtered out while at the same time multiple learning loops run through the process.

In essence, by making use of this way of approaching different levels with interventions, the most important learnings can drift upwards released from the whole of impressions and ideas on what happened. It is a way of adding learning loops from introduction to gameplay and debriefing. If participants are personally addressed and activated, this adds to their motivation and agency from the start (Bandura, 1989; Eisenhardt, 1989).

4.4.1 Interventions Per Phase that Contribute to Learning in/from SGs

In this paragraph, we name interventions per phase that can contribute to the forming of learning loops in SGs. Where possible we added literature references also from other disciplines that support the use of these interventions. Not all interventions mentioned here stem from publications, and we used extensive case study material collected between 2015 and 2021 for finding sensitizing concepts (Baarda, 2010; Bowen, 2020; Smaling, 2021). Sensitizing concepts can be used when there is a lack of theory development and or empirical research, which is the case in facilitated interventions in SGs. So far, we did not find any examples of studies using the interventions categorized in the following as sensitizing concepts in the Radboud University Library, Google scholar, Web of Science, and the ERIC (Educated Recourses Information Center) database. Further along in the Ph.D. research, these sensitizing concepts are further analyzed and made definitive. In the list, quite a few interventions were taken in, but many interventions can be combined. Sometimes, it is also possible to select some interventions for the gameplay invitation, giving the participants homework so they start being interested in the simulation and are better prepared showing up in the session.

Some findings on applying meta learning interventions.

Kwok et al. (2002) and Limayem and DeSanctis (2000) found that meta interventions on process improve the decision making processes in the context of group decision making. Likourezos et al. (2019) found that extensive instruction was more favorable to experienced learners as opposed to novice learners because there was less pressure on the working memory of the experienced learners. This suggests conducting short introductions and less complex ones for novice learners.

Facilitators are there to fill the gap where either the participants and/or the simulation games leave room for learning. Though the types of interventions below are described separately they can be interwoven so the same intervention contains, for instance, a buy in activity as well as frontloading and framing when, for example, being used in a storytelling introduction.

Types of facilitated interventions before the gameplay to reduce cognitive load and increase GCL:

I. **Buy into interventions in SGs (inductive developed concept developed based on concept from 10 case studies, De Wijse 2015–2021)**

   We define 'buy into interventions in SGs' as actions of the facilitator that contribute to the participants accepting the facilitator in his or her role, accepting the simulation game, and accepting the learning environment as a whole including the other participants. If the buy into succeeds this contributes to a safer learning environment and the acceptance of feedback. In addition, when participants connect to the facilitator, the gameplay, and each other, it decreases distracting group dynamics (ECL) and increases

attention for learning goals (GCL). And example is a facilitator sharing some personal details and personal experiences on how he or she learned from a simulation game.

Buy into interventions are a form of attenuation because they provide a variety reduction. Participants get to know the facilitator and each other, and possibly some information is shared on the program and the simulation game. This reduces variety in their frames of reference because they get to place the new information in relation to the information that was known to them. They develop an understanding of the situation they are dealing with.

II. **Team building interventions** (Lacerenza et al., 2018) **and functional role division** Vennix (1999)

A facilitator can assign functional roles such as a chair; timekeeper; secretary keeping track of planning, organizing, and documenting; a process coach; and a content coach. Splitting up tasks and assigning tasks that might otherwise be overlooked reduced complexity (ECL) and enhanced GCL. The Wagemans empirical research into how to foster self-managing teams (2001) has implications for how to organize conditions for effective teams such as having a clear goal and enabling structure and sufficient challenge. A facilitator can adapt challenges and their complexity to the team's goals and allow the team for working on a team goal. Janich (2016) highlights that a facilitator in learning and change processes should accommodate for motivation, commitment, individual, and team building also to ensure transfer after the intervention. Team building in her opinion is related to the transfer of the learnings after the intervention by laying the commitment to learn and capture the learnings within the team.

Team building interventions are a form of amplification and attenuation at the same time, because of people getting to know each other and by going through the team development phases (Tuckman, 1965) *often leading to taking on certain team roles. They develop skills to deal with the specific traits of the team which is a form of amplification. The combined skills of the team add to the skills of the individuals if the team develops well.*

III. **Framing interventions** (Fanning & Gaba, 2007) **and establishing a learning contract** (Anderson et al., 2014; Frank & Scharf, 2013; Laycock & Stephenson, 2013). Framing is a technique that is aimed at enhancing the relevance and meaning of the learning goals in relation to the simulation game.

III a. *Framing intervention for expectancy guidance*.
Four questions on expectancy management provide an example of a framing intervention that simultaneously establishes a learning contract (taken from three case studies De Wijse, 2015–2021) what do participants expect;

1. Toward the session.
2. Toward the SGs (discuss difficulty level of game, process).
3. Toward the facilitator, to establish mutual trust and connection, that everyone is active and contributing and what people can expect of the facilitator and vice versa.
4. Toward each other (how do we deal with learning with and from each other in this SG), establish norms for feedback and dealing with frustrations, everyone can exert a stop rule or temporarily leave the game to consult with the facilitator. Toward the norming, storming, and forming phases (Tuckman, 1965) that always are present within newly formed groups or teams, that can impede effective performance. By having participants recognize these processes in an early stage, they can address these dynamics more functionally from a meta perspective to move to effective functioning as a group. Otherwise, negative group dynamics can stand in the way of achieving learning goals.

The rationale behind this expectancy guidance intervention is to reduce unnecessary variety ECL and increase GCL. When people know what to expect they can let go of other issues that might disturb, distract, or worry them and they can be more focused on their learning goals. On page 269, Plass et al. (2015) and Eccles et al. (1998) suggested to organize student motivation (i.e., 'Can I do this?', 'Do I want to do this, and why?', and 'What do I need to do to succeed?'). Sweller et al. (2007) found in an empirical study that a more structured and guided instruction is more efficient and increases learning outcomes by reducing cognitive load in experiential and problem-based learning contexts.

Framing is a form of attenuation, a complexity reduction takes place by bringing focus and relevance into the learning aims. All simulation games are complex communication structures in which many different events and learning opportunities can take place. By using a framing intervention participants can bring more focus on how the simulation game can contribute to their learning goals.

III b. *Storytelling as intervention* (Kickmeier-Rust et al., 2011) *for the introduction to explain relevance and in game goals*

Storytelling is making use of a narrative to bring logic to information transfer; when used in the introduction, the scenario, roles, rules, and resources can be connected in a meaningful way for participants who need to learn to play the game. This intervention reduces ECL because participants understand the relevance of game mechanics and their goals in the game.

Storytelling is a framing intervention; it is a way of variety reduction by making a logical argumentation in the form of a story. Therefore, it is an attenuation intervention. It may also call on previous memory, schemata, and surface skills and experiences with participants and can cause amplification as well because of skill enlargement. The repertoire of response of the participants can increase due to the recognition and the feeling they know what to do in the situation they are situated in.

IV. **Frontloading intervention** (Fanning & Gaba, 2007)

- **Frontloading on roles** in the game on process level leads to a reduction in ECL by frontloading increasing (agency) GCL. If possible, have people choose roles to increase agency (Deen, 2015). Also, certain roles might be harder to perform than others; if people can make a conscious decision about this, they often better accept the consequences due to agency (Plass et al., 2011; Toh & Kirschner, 2020).
- **Frontloading on learning from SGs**, relating for instance to the possibilities of running into the valley of despair Preparing participants that experimenting provides feedback to learn from, and that making mistakes is also making learning opportunities. It is natural for experiential learning to reflect on challenges, and the simulation game provides opportunities to experiment. Preparing participants to learning in SGs can reduce stress levels and ECL because they are more prepared on what to expect.
- **Frontloading on the content of the simulation game**, so people know what to expect and so they can plan for actions in the game in line with their ambitions and learning goals, and this reduces ECL and increases GCL.

Frontloading is a form of attenuation; preparation reduces variety. People are prepared for what is expected of them and what they may encounter, and they are allowed forming anticipatory thoughts.

V. **Goal setting intervention** (Arraya et al., 2015; Fandt et al., 1990; Garcia-Marquez & Bauer, 2021; Kolfschoten & Rouwette, 2006; Nebel et al., 2016; Plass et al., 2015)

This intervention contains the translation of personal goals toward goals in the gameplay by having a preparation phase zero, connection of personal learning goals to game goals, and prepared strategies for the gameplay. This approach reduces variety because people have had time to prepare and know what to focus on in the gameplay (increase of GCL).

Goal setting is an attenuative intervention; focusing on goals and connecting to participants' already developed schemata in relation to their goals reduce variety. For instance, a participant focuses on personal

effectivity skills and aims at having reflective thoughts on one's own functioning given the feedback received.

VI. **Phase Zero intervention**; have the participants prepare before the start of the gameplay

After the general introduction, participants can prepare themselves for the actions in the gameplay. They experience more agency and motivation if goals are clear and if they set targets for themselves and think through how they want to achieve this and what behavior is needed.
The usage of structured questions to prepare and reflect relates to more learning (see Nakamura, 2021). So far a preparation phase zero was not mentioned in the literature except for the recent study by Nakamura (2021). We defined phase zero as a sensitizing concept in this study because also other activities can belong to this phase in addition to having pre-structured questions. Other activities might contribute to forming teams such as having a team name, preparing for learning goals in the game, and how this relates to the learning goals outside the game.
Janich (2016) in a publication on organizational change and the role of the facilitator in transfer refers to action research that concluded a preparation pre-planning phase adds to generating sustainable learning results because of the commitment and monitoring this approach accommodates.

The phase zero intervention is attenuative in the sense participants can prepare and think of what behavior in the gameplay can contribute to their learning goals. Simultaneously in this reflective phase participants can develop reflective skills and even cooperative skills if they prepare together with other participants. They learn to get to know each other and each other's goals and ideas behind how to approach the first game round and can make agreements on what strategies to pursue.

VII. **Reflection time outs intervention** with individual, group, and organization leveling to attend to dysfunctional variety and focus on learning goals

'Red thread' reflection with open questions, relations personal learning goals to (role)group and organizational goals/sustainable survival goals. Nakamura (2021) used structured reflection questions that prepared participants toward their decisions in the simulation game with a significant positive effect. In medical simulations, some research after time outs were performed and it was found unstructured time outs do not render a positive result because participants do not realize how to use the extra time to learn (Lee et al., 2020; McMullen et al., 2016). Lee-Kelley (2018) confirms the importance of connecting experiences to learning during and in simulation game reflections and refers to longitudinal empirical evidence research toward the relevance of learning from experience both inside simulation games and toward learning in general. She highlights the role of making explicit learnings in the process of reflection.

Pre-structured reflections basics:

1. What went well? (encourages to find positive learning).
2. What needs improvement? (encourages to find leverage points for learning).
3. What do you need from yourself and from others to achieve your goal (s)? (encourages to reflect on a third-order level to see how one can add value and what is needed from others).

This three-step method further focuses on GBL and reduces ECL so participants have concrete handholds to work with when leaving the debriefing. If these time out reflection cycles are repeated after every game round people can reflect on their previous answers, then the next phase the debrief can serve as a decent and concrete wrap-up. Lee-Kelley (2018) confirms in her study the repetition of reflecting on experience should take place throughout the simulation game and, in the debriefing, we interpret this as the advice that follow-up learning cycles should take place. Yang et al. (2018) conducted an experimental approach to research the effect of reflection on goal setting. The results showed when reflection is added to goal setting, learning outcomes increase, especially in combination with a challenging goal.

Time out reflections are attenuative in the sense that they reduce variety by adding questions that focus on what needs to be learned. The amplifying component of time out reflections consists of the process of analyzing and reflecting the actions participants go through. The adaptation of schemata and pre-planning of the next round based on the learning can add to skill development.

VIII. **Structured interactive debriefing reflection after the simulation game**
Structured interactive debriefing is a proven method for increasing learning effectivity; see review study by Tannenbaum (Fanning & Gaba, 2007; Keiser & Arthur Jr, 2021; Raemer et al., 2011; Tannenbaum & Cerasoli, 2013; Wang et al., 2011). Fraser et al. (2018) advise to use structured debriefing and other cognitive load-reducing techniques such as using visualizations, a white board, pre-debriefing, taking measures for safe learning, and optimizing the group size, i.e., do not debrief only in a (big) plenary group.
We suggest to debrief from the individual level to role group/team level to simulation game (organization) level and transfer to reality. The individual/group/team level cascaded reflection we regard as a sensitizing concept, and so far no literature references on this concept are known to us.
Success factors on using guided questions in time outs and debriefing from the case studies:

a. Use (digital) flaps/documents that provide overview and make sure that everyone contributes. If participants have filled out the flap or form after every time out it serves as an overview on the developments they made

through during the gameplay and is a handhold for reflection on the final results in the debriefing. Reduction of complexity is optimized with a focus on learning goals and even outcomes outside learning goals. Because beforehand it is not predictable what a participant will learn, maybe someone learns even more relevant issues than stated in the learning goals. It is also dependent on how learning goals are stated and on what (meta) level they are described.

b. The landscape method (em. Prof. Jan Klabbers) can aid in directing attention to the process and meta level reflection of learning. In this method, participants are asked to draw and describe their (emotional) journey through the game. For example, first, we did not see the trees from the forest, and we just tried different routes feeling a bit unsure, then we got trapped in the swamp because we used nearly all of our resources, and indecisiveness and lack of leadership led to frustration. After a while, the sun came through because we accepted our mistakes and found out how we could leave the swamp. Other methods to reflect on process and emotions are, for instance, expressing with your team in a visual way how your feel after the simulation game regarding your learning outcomes (source Dr. Roger Greenaway https://reviewing.co.uk) or using a series of images and participants select a few that they feel connect to their experiences in the gameplay (Laura Angelini, case study nov 2021).

When participants follow up on the interventions they are not only supported by the facilitation in bringing focus to their learning goals, but they also are enacting the skills necessary to learn to learn among which reflection and conceptualization (learning phases Kolb) actively make sense of their situation by using third-order reflections from their role perspectives. The facilitator provides the structural setup generating learning loops for the participants to go through as a learning process paving the way for GCL so they can learn in an optimized way from the simulation game.
Structured debriefs attenuate because of bringing focus to learnings and in the process amplify skills of participants regarding self-reflection, understanding of perspectives, and elaboration to their schemata and behavioral repertoire, for instance, in dealing with feedback.
For now, we conclude this paragraph with examples from theory and sensitizing concepts from literature and move on to the case studies that describe a favorable and less favorable learning situation for both facilitators and participants.

4.5 Summary and Conclusion

We start with an overview of a table containing a short summary of interventions elaborated upon in paragraph 4 that contribute to skill, reduction of extraneous cognitive load, enlarging germane cognitive load, or all at the same time.

Types of facilitated interventions before the gameplay to reduce cognitive load and increase GCL

Types of interventions	Types of interventions
I. Buy into	*Attenuation*
II. Teambuilding	*Amplification and Attenuation*
III. –Framing and establishing a learning contract	*Attenuation*
–Story telling during introduction	*Attenuation and amplification*
–Expectancy guidance and framing	*Attenuation*
IV. Frontloading	*Attenuation*
V. Goal setting	*Attenuation*
VI. Phase zero	*Attenuation*
VII. Reflection time outs	*Attenuation*
VIII. Structured interactive debriefing reflection	*Attenuation*

In this chapter, we found answers to the rationale for interventions in relation to the following:

The function of interventions used which are *attenuation* and *amplification*

Both contribute to the viability of systems, in this case, human actors in simulation games. Attenuation can be used for the reduction of ECL and amplification is related to skill development because increase in skills can add to the adaptivity of participants. In interventions attenuation and amplification can occur simultaneously, for instance when a facilitator brings focus via structured questions and at the same time opens up new perspectives.

Attenuative interventions are aimed at learning optimization by unnecessary complexity reduction (ECL) while increasing attention for learning goals (GCL)

These are facilitated interventions for *attenuation*; the variety is reduced to a level on which participants can learn. The reduction of variety is conducted by focusing individuals on their (emergent) learning goals. This does not mean that the learning goals have to be fixed before the game simulation; sometimes emergent learning happens. As long as there is a regular reflection on meaningful and relevant learning outcomes, learning goals can evolve during gameplay and reflection. Along these learning paths, complexity can be reduced by creating connections, for instance, by attaching personal learning goals to the groups' goals and the goals of the simulation in preparation and reflection time outs creating multiple reinforcing learning loops to learn from.

Amplifying interventions are aimed at increasing skill with participants in learning to learn

Among these are skills such as cooperation, decision making skills, learning to learn, and learning to give and deal with feedback. In applying these skills, participants are able to receive personalized feedback that can fuel their reflective

learning processes. Skill enlargement applies to *amplification*; the variety of responses is enlarged and therefore can deal with more variety in the form of challenges from their learning environment.

Learning loops, for example, in the form of structured time out reflections can accommodate for both attenuations (less ECL and increased GCL) while at the same time provide opportunity for amplification (skill development). Learning loops take the learner by hand if facilitated well by the facilitator and can hence play a role in enhancing learning skills by more effective use of feedback via reflection and experimentation. If learning loops are consistently designed from start to debriefing, the learning loops can reinforce one another and bring focus to learning processes as shown in the positive case study.

To summarize a remark on what type of contextual challenges can trigger certain interventions. Rule-based simulation games with extensive rules and procedures mainly trigger first-order interventions aimed at content and procedures, have a high potential to cause alienation and demotivation to learn. Interventions aimed at more reflexivity and questioning content and procedures can increase agency and trigger second- (process learning investigating norms) and third-order learning (metacognitive skills on learning to learn and how to add value from a role in a system).

A facilitator has a role to fill the gaps the simulation and participants leave open to optimize learning opportunities. If the simulation generates too much complexity, it needs to be reduced. If participants get caught up in the action, the facilitator can impose a time out to make sure reflection takes place aimed at personal learning goals. Filling the gap does not mean solving the gap, because the main role of the facilitator is to provide learning opportunities; sometimes also by not filling the gap but making visible the learning opportunities arising from these gaps.

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Self-assessment questions

1. Which two perspectives will you consider when preparing facilitation or when you are facilitating in action?

    a. Answer 1. The skill level of participants, do you need to intervene on that, for example, by pre-structuring questions for reflection, or designing reflective loops into the simulation game that cause participants to structurally reflect on the feedback of the game?
    b. Answer 2. Optimizing germane cognitive load by lowering extraneous cognitive load (i.e., disturbances that do not contribute to learning such as distractions from the environment and distractions participants experience in their learning process), for instance, by intervening via questions, for instance, by asking ‘how is this behavior contributing to your learning goal?’ when participants get caught up in the action that does not contribute to germane cognitive load.

2. What are tools/interventions that can be used to optimize effective learning from the simulation game?
   Answer see paragraph 4.
3. How do learning loops add to skill development and focus on learning goals?
   Answer see paragraph 3 and paragraph 4 for practical examples and paragraph 5 for conclusion and summary.

Future Reading

- *For literature on facilitation*
  Read book chapter in this book on **Formative assessment as leverage point for learning to interconnect and align design, facilitation and debriefing by De Wijse and Kriz**
  de Wijse-van Heeswijk, M. (2021). "Ethics and the Simulation Facilitator: Taking your Professional Role Seriously." Simulation & Gaming **52**(3): 312–332.
- *For literature on open SGs/policy games*
  The magic circle: principles of gaming & simulation by em. Prof Dr. J.H.G. Klabbers, 2009, 3rd revised edition
  Policy games, pathways into the unknown, 2014, Prof Dr. R.D. Duke and prof. Dr. J.L.A. Geurts, free copy available on www.isaga.com or email marieke.dewijsevanheeswijk@ru.nl
- *Further reading on organization/game structures that impede learning and explanations how socio technical systems (SGs are socio technical systems because of social actors interacting with the SGs technology) work*:
  Organizations social systems conducting experiments, Achterbergh J., and Vriens. D.
  Contact address author Marieke de Wijse: marieke.dewijse-vanheeswijk@ru.nl and please send through new literature references on interventions you found that are not added into this article yet. It is difficult to find theory on interventions in change and learning and it is possible other fields of knowledge can contribute to this research too.

References

Achterbergh, J., & Vriens, D. J. (2010). *Organizations: social systems conducting experiments* (2nd rev. ed.). Springer.

Achterbergh, J., & Vriens, D. J. (2019). *Organizational development*. Routledge.http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1761619. https://www.taylorfrancis.com/books/9781315695228

Alklind Taylor, A.-S. (2014). *Facilitation matters: A framework for instructor-led serious gaming*. University of Skövde.

Alklind Taylor, A.-S., Backlund, P., & Niklasson, L. (2012). The coaching cycle: A coaching-by-gaming approach in serious games. *Simulation & Gaming, 43*(5), 648–672.

Amy, A. H. (2008). Leaders as facilitators of individual and organizational learning. *Leadership & Organization Development Journal, 29*(3), 212–234. https://doi.org/10.1108/01437730810861281

Anderson, G., Boud, D., & Sampson, J. (2014). *Learning contracts: A practical guide*. Routledge.

Argyris, C. (1970). *Intervention theory and method: A behavioral science view*. Addison-Wesley Reading.

Argyris, C. (2002). Double-loop learning, teaching, and research. *Academy of Management Learning & Education, 1*(2), 206–218. https://doi.org/10.5465/amle.2002.8509400

Argyris, C. (2004). Reflection and beyond in research on organizational learning. *Management Learning, 35*(4), 507–509. https://doi.org/10.1177/1350507604048276

Argyris, C., & Schön, D. A. (1996). *Organizational learning II: theory, method, and practice* (Repr., with corr. ed.). Addison-Wesley.

Argyris, C., Schon, D. A., & Greenwood, D. J. (1997). Organizational learning II: Theory, method, and practice. *Industrial & Labor Relations Review., 50*(4), 701.

Arraya, M. A., Pellissier, R., & Preto, I. (2015). Team goal-setting involves more than only goal-setting. *Sport Business and Management-an International Journal, 5*(2), 157–174. https://doi.org/10.1108/sbm-11-2012-0046

Baard, V. (2010). A critical review of interventionist research. *Qualitative Research in Accounting and Management, 7*(1), 13. https://doi.org/10.1108/11766091011034262

Baard, V. C., & Dumay, J. (2020). Interventionist research in accounting: Reflections on the good, the bad and the ugly. *Accounting & Finance, 60*(3), 1979–2006.

Baarda, B. (2010). *Research: This is it: Guidelines for setting up, doing and evaluating quantitative and qualitative research* (1e ed.). Noordhoff.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175–1184. https://doi.org/10.1037/0003-066x.44.9.1175

Bateson, G. (1991). Ecology of mind: The sacred. In *A sacred unity. Further steps to an ecology of mind*. Bessie/HarperCollins. (Original work published 1975).

Bedwell, W. L., Pavlas, D., Heyne, K., Lazzara, E. H., & Salas, E. (2012). Toward a taxonomy linking game attributes to learning: An empirical study. *Simulation & Gaming, 43*(6), 729–760. https://doi.org/10.1177/1046878112439444

Bekebrede, G., Lo, J., & Lukosch, H. (2015). Understanding complexity: The use of simulation games for engineering systems. *Simulation and Gaming, 46*(5), 447–454. https://doi.org/10.1177/1046878115618140

Berta, W., Cranley, L., Dearing, J. W., Dogherty, E. J., Squires, J. E., & Estabrooks, C. A. (2015). Why (we think) facilitation works: insights from organizational learning theory. *Implementation Science, 10*, 13, Article 141. https://doi.org/10.1186/s13012-015-0323-0

Bogost, I. (2008). *The rhetoric of video games*. MacArthur Foundation Digital Media and Learning Initiative.

Bowen, G. A. (2020). *Sensitizing concepts*. SAGE Publications Limited.

Brown, S., & Vaughan, C. (2009). Play: How it shapes the brain. In *Opens the imagination, and invigorates the soul* (pp. 112–113).

Carrera, A. M., Naweed, A., Leigh, E., Crea, T., Krynski, B., Heveldt, K., Lyons, M., Knott, C., & Khetia, S. (2016). Constructing safe containers for effective learning: Vignettes of breakdown in psychological safety during simulated scenarios. In *Intersections in simulation and gaming* (pp. 15–29). Springer.

Cheng, A., Morse, K. J., Rudolph, J., Arab, A. A., Runnacles, J., & Eppich, W. (2016). Learner-centered debriefing for health care simulation education: Lessons for faculty development. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 11*(1), 32–40. https://doi.org/10.1097/SIH.0000000000000136

Cook, D. A., Brydges, R., Hamstra, S. J., Zendejas, B., Szostek, J. H., Wang, A. T., Erwin, P. J., & Hatala, R. (2012). Comparative effectiveness of technology-enhanced simulation versus other instructional methods: A systematic review and meta-analysis. *Simulation in Healthcare, 7*(5), 308–320.

De Ronde, M. (2015). Speelruimte voor ervaring en reflectie. In *Een praktijkgericht onderzoek naar het gebruik van spel in begeleidingssituaties [Space to play for experience and reflection]*. Eburon.

Deen, M. (2015). *GAME games autonomy motivation & education*. Lulu.com.

DeSanctis, G., & Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science, 5*(2), 121.

Dieckmann, P. (2020). The unexpected and the non-fitting—Considering the edges of simulation as social practice. *Advances in Simulation (London, England), 5*, 2. https://doi.org/10.1186/s41077-020-0120-y

Dieckmann, P., Molin Friis, S., Lippert, A., & Ostergaard, D. (2009). The art and science of debriefing in simulation: Ideal and practice. *Medical Teacher, 31*(7), 287–294.

Duke, R. D. (2014). *Gaming: The future's language*. W. Bertelsmann Verlag.

Dumay, J., & Baard, V. (2017). An introduction to interventionist research in accounting. In *The Routledge companion to qualitative accounting research methods* (pp. 265–283).

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed.

Edmondson, A., & Moingeon, B. (1998). From organizational learning to the learning organization. *Management Learning, 29*(1), 5–20.

Edmondson, A. C. (1996). Three faces of eden: The persistence of competing theories and multiple diagnoses in organizational intervention research. *Human Relations, 49*(5), 571–595. https://doi.org/10.1177/001872679604900503

Eisenhardt, K. M. (1989). Agency theory—An assessment and review. *Academy of Management Review, 14*(1), 57–74. https://doi.org/10.5465/amr.1989.4279003

Elkjaer, B. (2004). Organizational learning—The 'third way.' *Management Learning, 35*(4), 419–434. https://doi.org/10.1177/1350507604048271

Ellis, G. (2018). So, what are cognitive biases? In G. Ellis (Ed.), *Cognitive biases in visualizations* (pp. 1–10). Springer International Publishing. https://doi.org/10.1007/978-3-319-95831-6_1

Ellis, S., Carette, B., Anseel, F., & Lievens, F. (2014). Systematic reflection: Implications for learning from failures and successes. *Current Directions in Psychological Science, 23*(1), 67–72. https://doi.org/10.1177/0963721413504106

Fandt, P. M., Richardson, W. D., & Conner, H. M. (1990). The impact of goal setting on team simulation experience. *Simulation & Gaming, 21*(4), 411–422. https://doi.org/10.1177/104687819002100405

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(2), 115–125.

Faria, A. J., Hutchinson, D., Wellington, W. J., & Gold, S. (2008). Developments in business gaming: A review of the past 40 years. *Simulation & Gaming, 40*(4), 464–487. https://doi.org/10.1177/1046878108327585

Franco, L. A., Hämäläinen, R. P., Rouwette, E. n. A. J. A., & Leppänen, I. (2020). Taking stock of behavioural OR: A review of behavioural studies with an intervention focus. *European Journal of Operational Research*. https://doi.org/10.1016/j.ejor.2020.11.031

Frank, T., & Scharf, L. F. (2013). Learning contracts in undergraduate courses: Impacts on student behaviors and academic performance. *Journal of the Scholarship of Teaching and Learning, 13*(4), 36–53.

Fraser, K. L., Meguerdichian, M. J., Haws, J. T., Grant, V. J., Bajaj, K., & Cheng, A. (2018). Cognitive load theory for debriefing simulations: Implications for faculty development. *Advances in Simulation (London, England), 3*, 28. https://doi.org/10.1186/s41077-018-0086-1

Fuchs, C. (2002). Some implications of Anthony Giddens' works for a theory of social self-organization. *Emergence, 4*(3), 7. https://doi.org/10.1207/S15327000EM0403-03

Garcia-Marquez, C., & Bauer, K. N. (2021). An examination and extension of the theory of gamified learning: The moderating role of goal orientation. *Simulation & Gaming, 52*(4), 407–434. https://doi.org/10.1177/1046878120958741

Geiger, M. A., Boyle, E. J., & Pinto, J. (1992). A factor analysis of Kolb's revised learning style inventory. *Educational and Psychological Measurement, 52*(3), 753–759. https://doi.org/10.1177/0013164492052003026

Geithner, S., & Menzel, D. (2016). Effectiveness of learning through experience and reflection in a project management simulation. *Simulation & Gaming, 47*(2), 228–256. https://doi.org/10.1177/1046878115624312

Gonzalez, C. (2005). Task workload and cognitive abilities in dynamic decision making. *Human Factors, 47*(1), 92–101. https://doi.org/10.1518/0018720053653767

Gugerell, K., & Zuidema, C. (2017). Gaming for the energy transition. Experimenting and learning in co-designing a serious game prototype. *Journal of Cleaner Production, 169*, 105–116. https://doi.org/10.1016/j.jclepro.2017.04.142schein

Hamdaoui, N., Idrissi, M. K., & Bennani, S. (2018). Modeling learners in educational games: Relationship between playing and learning styles. *Simulation & Gaming, 49*(6), 675–699. https://doi.org/10.1177/1046878118783804

Harteveld, C. (2011). *Triadic game design: Balancing reality, meaning and play*. Springer Science & Business Media.

Hattie, J., Biggs, J., & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of Educational Research, 66*(2), 99–136. https://doi.org/10.3102/00346543066002099

Hazy, J. K., & Uhl-Bien, M. (2015). Towards operationalizing complexity leadership: How generative, administrative and community-building leadership practices enact organizational outcomes. *Leadership, 11*(1), 79–104. https://doi.org/10.1177/1742715013511483

Hense, J., Kriz, W. C., & Wolfe, J. (2009). Putting theory-oriented evaluation into practice: A logic model approach for evaluating SIMGAME. *Simulation & Gaming, 40*(1), 110–133. https://doi.org/10.1177/1046878107308078

Heron, J. (1993). *Group facilitation: Theories and models for practice*. Kogan Page.

Herz, B., & Merz, W. (1998). Experiential learning and the effectiveness of economic simulation games. *Simulation & Gaming, 29*(2), 238–250.

Hubbard, T. L. (2018). *Spatial biases in perception and cognition*. Cambridge University Press.

Husebø, S. E., Dieckmann, P., Rystedt, H., Søreide, E., & Friberg, F. (2013). The relationship between facilitators' questions and the level of reflection in postsimulation debriefing. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 8*(3), 135–142. https://doi.org/10.1097/SIH.0b013e31827cbb5c

Janich, N. (2016). Facilitator withdrawal from organizational change initiatives: A review of strategies and guidelines. *Group Facilitation: A Research & Applications Journal, 13*.

Jones, K. (1998). What are we talking about? *Simulation & Gaming, 29*(3), 314–320. https://doi.org/10.1177/1046878198293006

Kalyuga, S., & Singh, A.-M. (2016). Rethinking the boundaries of cognitive load theory in complex learning. *Educational Psychology Review, 28*(4), 831–852. https://doi.org/10.1007/s10648-015-9352-0

Kato, F. (2010). How we think and talk about facilitation. *Simulation & Gaming, 41*(5), 694–704.

Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning & Education, 1*(2), 137–149.

Keiser, N. L., & Arthur, W., Jr. (2021). A meta-analysis of the effectiveness of the after-action review (or debrief) and factors that influence its effectiveness. *Journal of Applied Psychology, 106*(7), 1007.

Khalifa, M., Kwok, R.-W., & Davison, R. (2002). The effects of process and content facilitation restrictiveness on GSS-mediated collaborative learning. *Group Decision and Negotiation, 11*(5), 345–361.

Kickmeier-Rust, M. D., Augustin, T., & Albert, D. (2011). Personalized storytelling for educational computer games. In M. Ma, M. F. Oliveira, & J. M. Pereira (Eds.), *Serious games development and applications* (Vol. 6944, pp. 13+). <Go to ISI>://WOS:000306582700002

Kirschner, P., Sweller, J., & Clark, R. E. (2006). Why unguided learning does not work: An analysis of the failure of discovery learning, problem-based learning, experiential learning and inquiry-based learning. *Educational Psychologist*, *41*(2), 75–86.

Klabbers, J. H. G. (2009). *The magic circle: Principles of gaming & simulation* (3rd and rev. ed.). Sense Publishers.

Knipfer, K., Kump, B., Wessel, D., & Cress, U. (2013). Reflection as a catalyst for organisational learning. *Studies in Continuing Education, 35*(1), 30–48. https://doi.org/10.1080/0158037x.2012.683780

Kolb, A. Y., & Kolb, D. A. (2008). The learning way: Meta-cognitive aspects of experiential learning. *Simulation & Gaming, 40*(3), 297–327. https://doi.org/10.1177/1046878108325713

Kolb, A. Y., & Kolb, D. A. (2009). The learning way: Meta-cognitive aspects of experiential learning. *Simulation & Gaming, 40*(3), 297–327. https://doi.org/10.1177/1046878108325713

Kolb, A. Y., Kolb, D. A., Passarelli, A., & Sharma, G. (2014). On becoming an experiential educator: The educator role profile. *Simulation & Gaming, 45*(2), 204–234. https://doi.org/10.1177/1046878114534383

Kolb, D. A., Rubin, I. M., & Mcintre E, J. M. (1984). Organizational psychology: An experiential approach to organizational behavior. *Journal of Occupational Psychology, 57*, 331.

Kolfschoten, G., Den Hengst-Bruggeling, M., & De Vreede, G. J. (2007). Issues in the design of facilitated collaboration processes. *Group Decision and Negotiation, 16*(4), 347–361.

Kolfschoten, G. L., Briggs, R. O., Appelman, J. H., & de Vreede, G. J. (2004). Think lets as building blocks for collaboration processes: A further conceptualization. In G. J. DeVreede, L. A. Guerrero, & G. M. Raventos (Eds.), *Groupware: Design, Implementation, and Use, Proceedings* (Vol. 3198, pp. 137–152). <Go to ISI>://WOS:000224023500012

Kolfschoten, G. L., & Rouwette, E. A. (2006). Choice criteria for facilitation techniques.

Kriz, W. C., & Auchter, E. (2016). 10 years of evaluation research into gaming simulation for german entrepreneurship and a new study on its long-term effects. *Simulation & Gaming, 47*(2), 179–205. https://doi.org/10.1177/1046878116633972

Kriz, W. C., & Duke, R. D. (2014). *Back to the future of Gaming*. wbv Media GmbH & Company KG.

Kwok, R. C. W., Ma, R., & Vogel, D. R. (2002). Effects of group support systems and content facilitation on knowledge acquisition. *Journal of Management Information Systems, 19*(3), 185–229. <Go to ISI>://WOS:000180349300011

Lacerenza, C. N., Marlow, S. L., Tannenbaum, S. I., & Salas, E. (2018). Team development interventions: Evidence-based approaches for improving teamwork. *American Psychologist, 73*(4), 517–531. https://doi.org/10.1037/amp0000295

Lambrechts, F., Grieten, S., Bouwen, R., & Corthouts, F. (2009). Process consultation revisited. *Journal of Applied Behavioral Science, 45*(1), 39–58.

Lapalme, J., & Conklin, J. (2015). Combining process consultation and structural interventions. *Systems Research and Behavioral Science, 32*(3), 298–311. https://doi.org/10.1002/sres.2226

Lauer, R. H., & Crimson, D. E. (1972). Social change in the valley of despair. *Growth and Change, 3*(4), 9–14.

Laycock, M., & Stephenson, J. (2013). *Using learning contracts in higher education*. Routledge.

Lee-Kelley, L. (2018). When 'knowing what' is not enough: Role of organised simulations for developing effective practice. *International Journal of Project Management, 36*(1), 198–207. https://doi.org/10.1016/j.ijproman.2017.08.003

Lee, J. Y., Donkers, J., Jarodzka, H., Sellenraad, G., & Van Merriënboer, J. J. (2020). Different effects of pausing on cognitive load in a medical simulation game. *Computers in Human Behavior, 110*, 106385.

Leigh, E. (2003a). It all depends'. Interact, integrate, impact. In Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education ASCILITE.

Leigh, E. (2003b). A practitioner researcher perspective on facilitating an open, infinite, chaordic simulation. Doctor of Education. University of Technology. http://epress.lib.uts.edu.au/research/handle/2100/308

Leigh, E., Likhacheva, E., Tipton, E., Heeswijk, M. d. W.-v., & Zürn, B. (2021). Why facilitation? *Simulation & Gaming, 52*(3), 247–254. https://doi.org/10.1177/10468781211016914

Leigh, E., & Spindler, L. (2004). Simulations and games as chaordic learning contexts. *Simulation & Gaming, 35*(1), 53–69. https://doi.org/10.1177/1046878103252886

Leigh, E., & Spindler, L. (2005). Congruent facilitation of simulations and games. In *Gaming, simulations, and society* (pp. 189–198). Springer.

Leppink, J. (2017). Managing the load on a learner's mind: A cognitive load theory perspective. *Medical Science Educator, 27*(1), 5–7. https://doi.org/10.1007/s40670-017-0439-8

Likourezos, V., Kalyuga, S., & Sweller, J. (2019). The variability effect: When instructional variability is advantageous. *Educational Psychology Review, 31*(2), 479–497. https://doi.org/10.1007/s10648-019-09462-8

Limayem, M., & DeSanctis, G. (2000). Providing decisional guidance for multicriteria decision making in groups. *Information Systems Research, 11*(4), 386–401. https://doi.org/10.1287/isre.11.4.386.11874

Loo, R. (1999). Confirmatory factor analyses of Kolb's Learning Style Inventory (LSI-1985). *British Journal of Educational Psychology, 69*(2), 213–219. https://doi.org/10.1348/000709999157680

Lukosch, H. K., Bekebrede, G., Kurapati, S., & Lukosch, S. G. (2018). A scientific foundation of simulation games for the analysis and design of complex systems. *Simulation & Gaming, 49*(3), 279–314. https://doi.org/10.1177/1046878118768858

Marion, R., & Uhl-Bien, M. (2007). Introduction to the special issue on leadership and complexity. *Leadership Quarterly, 18*(4), 293–296. https://doi.org/10.1016/j.leaqua.2007.04.001

Marzano, R. J., Pickering, D., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Ascd.

McMullen, M., Wilson, R., Fleming, M., Mark, D., Sydor, D., Wang, L., Zamora, J., Phelan, R., & Burjorjee, J. E. (2016). "Debriefing-on-Demand": A pilot assessment of using a "Pause Button" in medical simulation. *Simulation in Healthcare, 11*(3), 157–163. https://doi.org/10.1097/sih.0000000000000140

Nakamura, M. (2021). Unpacking and disclosing the reasoning behind "A Structured Instruction Improves Team Performance". In *Conference Proceedings ISAGA Indore 21*.

Nebel, S., Schneider, S., Schledjewski, J., & Rey, G. D. (2016). Goal-setting in educational video games: Comparing goal-setting theory and the goal-free effect. *Simulation & Gaming, 48*(1), 98–130. https://doi.org/10.1177/1046878116680869

Nielsen, K., & Abildgaard, J. S. (2013). Organizational interventions: A research-based framework for the evaluation of both process and effects. *Work & Stress, 27*(3), 278–297.

Nielsen, K., & Miraglia, M. (2017). What works for whom in which circumstances? On the need to move beyond the 'what works?' Question in organizational intervention research. *Human Relations, 70*(1), 40–62.

Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist, 38*(1), 1–4.

Plass, J. L., Homer, B. D., Kinzer, C., Frye, J., & Perlin, K. (2011). Learning mechanics and assessment mechanics for games for learning. *G4LI White Paper, 1*, 2011.

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist, 50*(4), 258–283.

Raadt, J. D. R. d. (1987). Ashby's law of requisite variety: an empirical study. *Cybernetics and Systems, 18*(6), 517–536. https://doi.org/10.1080/01969728708902152

Raemer, D., Anderson, M., Cheng, A., Fanning, R., Nadkarni, V., & Savoldelli, G. (2011). Research regarding debriefing as part of the learning process. *Simulation in Healthcare, 6*(7), S52–S57. https://doi.org/10.1097/SIH.0b013e31822724d0

Raghothama, J. (2017). *Integrating computational and participatory simulations for design in complex systems*. Doctoral dissertation. KTH Royal Institute of Technology.

[Record #53 is using a reference type undefined in this output style].

Ren, Y. (2018). *Debriefing Open Simulation Games in Higher Education and Organisations: Practices of Experts*. University of Twente.

Reynolds, M. (2014). Triple-loop learning and conversing with reality. *Kybernetes, 43*(9–10), 1381–1391. https://doi.org/10.1108/k-07-2014-0158

Rouwette, E., Vennix, J. A. M., & van Mullekom, T. (2002). Group model building effectiveness: A review of assessment studies. *System Dynamics Review, 18*(1), 5–45.

Rudolph, J. W., Foldy, E. G., Robinson, T., Kendall, S., Taylor, S. S., & Simon, R. (2013). Helping without harming: The instructor's feedback dilemma in debriefing—A case study. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 8*(5), 304–316. https://doi.org/10.1097/SIH.0b013e318294854e

Rudolph, J. W., Simon, R., & Raemer, D. B. (2007). Which reality matters? Questions on the path to high engagement in healthcare simulation. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 2*(3), 161–163. https://doi.org/10.1097/SIH.0b013e31813d1035

Schein, E. H. (1990). Organizational Culture. *American Psychologist, 45*(2), 109–119. https://doi.org/10.1037/0003-066x.45.2.109

Schmutz, J. B., Kolbe, M., & Eppich, W. J. (2018). Twelve tips for integrating team reflexivity into your simulation-based team training. *Medical Teacher, 40*(7), 721–727. https://doi.org/10.1080/0142159x.2018.1464135

Schwägele, S., Zürn, B., & Trautwein, F. (2012). *Planspiele-lernen im methoden-mix: Integrative Lernkonzepte in der Diskussion* (Vol. 4). BoD-Books on Demand.

Scott, R. J., Cavana, R. Y., & Cameron, D. (2016). Recent evidence on the effectiveness of group model building. *European Journal of Operational Research, 249*(3), 908–918. https://doi.org/10.1016/j.ejor.2015.06.078

Senge, P. M., & Sterman, J. D. (1992). Systems thinking and organizational learning—Acting locally and thinking globally in the organization of the future. *European Journal of Operational Research, 59*(1), 137–150. https://doi.org/10.1016/0377-2217(92)90011-w

Sewell, W. H. (1992). A theory of structure—Duality, Agency and transformation. *American Journal of Sociology, 98*(1), 1–29. https://doi.org/10.1086/229967

Sitter, L. U. d. (1981). *Op weg naar nieuwe fabrieken en kantoren: Produktie- organisatie en arbeidsorganisatie op de tweesprong: Een rapport inzake de kwaliteit van de arbeid, organisatie en arbeidsverhoudingen*. Kluwer.

Smaling, A. (2021). Sensitizing concepts, wat kun je ermee? *KWALON, 26*(1), 65–67. https://doi.org/10.5117/KWA2021.1.007.SMAL

Sterman, J. D., Repenning, N. P., McCardle-Keurentjes, M. H. F., Rouwette, E. n. A. J. A., Vennix, J. A. M., & Jacobs, E. (2018). Potential benefits of model use in group model building: Insights from an experimental investigation. *System Dynamics Review, 34*(1–2), 354–384. https://doi.org/10.1002/sdr.1603

Sutton-Smith, B. (2009). *The ambiguity of play*. Harvard University Press.

Sweller, J. (2020). *Human problem solving and instructional design*. Routledge. <Go to ISI>://WOS:000546235500004

Sweller, J., Kirschner, P., & Clark, R. (2007). Why minimally guided teaching techniques do not work: A reply to commentaries. *Educational Psychologist, 42*(2), 115–121.

Tan, B. C. Y., Wei, K.-K., & Lee-Partridge, J. E. (1999). Effects of facilitation and leadership on meeting outcomes in a group support system environment. *European Journal of Information Systems, 8*(4), 233.

Tannenbaum, S. I., & Cerasoli, C. P. (2013). Do team and individual debriefs enhance performance? A meta-analysis. *Human Factors, 55*(1), 231–245.

Taylor, A.-S. A. (2015). The active instructor: Benefits and barriers to instructor-led serious gaming. In *2015 7th International Conference on Games and Virtual Worlds for Serious Applications (VS-Games)*.

Tieben, R. (2015). Activating play: A design research study on how to elicit playful interaction from teenagers.

Tjosvold, D., Yu, Z. Y., & Hui, C. (2004). Team learning from mistakes: The contribution of cooperative goals and problem-solving. *Journal of Management Studies, 41*(7), 1223–1245. https://doi.org/10.1111/j.1467-6486.2004.00473.x

Toh, W., & Kirschner, D. (2020). Self-directed learning in video games, affordances and pedagogical implications for teaching and learning. *Computers & Education*, 103912.

Tosey, P. (2006). Bateson's levels of learning: a framework for transformative learning?.

Tosey, P., Visser, M., & Saunders, M. N. K. (2012). The origins and conceptualizations of 'triple-loop' learning: A critical review. *Management Learning, 43*(3), 291–307. https://doi.org/10.1177/1350507611426239

Tosterud, R., Kjølberg, K., Kongshaug, A. V., & Haugom, J. V. (2020). Exploration of two different structures for debriefing in simulation: The influence of the structure on the facilitator role. *Simulation & Gaming, 51*(2), 243–257. https://doi.org/10.1177/1046878120903467

Tsoukas, H. (2017). Don't simplify, complexify: From disjunctive to conjunctive theorizing in organization and management studies. *Journal of Management Studies, 54*(2), 132–215.

Tuckman, B. W. (1965). Developmental sequence in small groups. *Psychological Bulletin, 63*(6), 384–399. https://doi.org/10.1037/h0022100

Uhl-Bien, M., & Arena, M. (2017). Complexity leadership: Enabling people and organizations for adaptability. *Organizational Dynamics, 46*(1), 9–20. https://doi.org/10.1016/j.orgdyn.2016.12.001

Uhl-Bien, M., & Arena, M. (2018). Leadership for organizational adaptability: A theoretical synthesis and integrative framework. *The Leadership Quarterly, 29*(1), 89–104. https://doi.org/10.1016/j.leaqua.2017.12.009

van Laere, J., & Lindblom, J. (2019). Cultivating a longitudinal learning process through recurring crisis management training exercises in twelve Swedish municipalities. *Journal of Contingencies and Crisis Management, 27*(1), 38–49.

van Laere, J., Lindblom, J., & de Wijse-van Heeswijk, M. (2021). Complexifying facilitation by immersing in lived experiences of on-the-fly facilitation. *Simulation & Gaming*, 10468781211006751. https://doi.org/10.1177/10468781211006751

Van Merrienboer, J. J., & Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions. *Educational Psychology Review, 17*(2), 147–177.

Vennix, J. A. (1990). *Mental models and computer models: Design and evaluation of a computer-based learning environment for policy-making*. [Sl: sn].

Vennix, J. A. M. (1999). Group model-building: Tackling messy problems. *System Dynamics Review, 15*(4), 379–401. <Go to ISI>://WOS:000085273400003

Visser, M. (2004). *Deutero-learning in organizations: A review and a reformulation*. University of Nijmegen, Nijmegen School of Management UB Nijmegen [Host]. http://hdl.handle.net/2066/19481

Visser, M., Chiva, R., & Tosey, P. (2018). Levels of learning hither and whither. *Learning Organization, 25*(4), 218–223. https://doi.org/10.1108/tlo-02-2018-0021

Vriens, D., Achterbergh, J., & Gulpers, L. (2018). Virtuous structures. *Journal of Business Ethics, 150*(3), 671–690. https://doi.org/10.1007/s10551-016-3174-y

Wageman, R. (2001). How leaders foster self-managing team effectiveness: Design choices versus hands-on coaching. *Organization Science, 12*(5), 559–577. https://doi.org/10.1287/orsc.12.5.559.10094

Wang, E. E., Kharasch, M., & Kuruna, D. (2011). Facilitative debriefing techniques for simulation-based learning. *Academic Emergency Medicine, 18*(2), e5. https://doi.org/10.1111/j.1553-2712.2010.01001.x

Watt, K., & Smith, T. (2021). Research-based game design for serious games. *Simulation & Gaming, 52*(5), 601–613. https://doi.org/10.1177/10468781211006758

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual Review of Psychology, 50*(1), 361–386. https://doi.org/10.1146/annurev.psych.50.1.361

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 16*(4), 409–421. https://doi.org/10.1287/orsc.1050.0133

Wenzler, I., & Chartier, D. (1999). Why do we bother with games and simulations: An organizational learning perspective? *Simulation & Gaming, 30*(3), 375–384.

Wijse-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332. https://doi.org/10.1177/10468781211015707

Willcoxson, L., & Prosser, M. (1996). Kolb's learning style inventory (1985): Review and further study of validity and reliability. *British Journal of Educational Psychology, 66*, 247–257. https://doi.org/10.1111/j.2044-8279.1996.tb01193.x

Wollersheim, J., Leyer, M., & Sporrle, M. (2016). When more is not better: The effect of the number of learning interventions on the acquisition of process-oriented thinking. *Management Learning, 47*(2), 137–157. https://doi.org/10.1177/1350507615587447

Yahya, I. (1998). Willcoxson and Prosser's factor analyses on Kolb's (1985) LSI data: Reflections and re-analyses. *British Journal of Educational Psychology, 68*(2), 281–286.

Yang, M. M., Zhang, Y. C., & Yang, F. F. (2018). How a reflection intervention improves the effect of learning goals on performance outcomes in a complex decision-making task? *Journal of Business and Psychology, 33*(5), 579–593. https://doi.org/10.1007/s10869-017-9510-0

Zundel, M. (2013). Walking to learn: Rethinking reflection for management learning. *Management Learning, 44*(2), 109–126. https://doi.org/10.1177/1350507612440231

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Case Study Report on Facilitation Interventions to Increase Learning Effectiveness in Game Simulations

5

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Overview

Two extreme case studies are highlighted in this follow-up chapter (this is a practical case study following up on Chap. 4 with a theoretical base) on how facilitators can enhance learning via interventions. Case study 1 consists of a positive open simulation game (learning results and goals achieved), containing optimized conditions for learning and several facilitated interventions per game phase. The open simulation game case study delivered learning early on in the gameplay and resulted in mainly third-order learning (learning to learn, a well-developed role perspective on how one can add value from their role). Case study 2 consists of a negative rule-based simulation game (goals were not achieved, few learnings) with diminished learning conditions and the lack of impact of facilitated interventions per game phase. The learning results of the negative case study 2 were limited because participants did not perceive the game as useful and experienced the mainly content-oriented interventions by the facilitator not as helpful. The extraneous cognitive load resulting from the gameplay disturbed the effect of the process interventions by the facilitator, so participants did not learn from the guidance the facilitator tried to provide.

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Discussing these two opposite extreme case studies provides an overview of what conditions favour learning and what interventions contribute to learning. In the previous chapter, it was highlighted that facilitators can enhance learning complexity reduction (or attenuation) and skill enlargement (amplification). In the case studies, the types of interventions performed are highlighted and explained so they provide two contextualized examples of how interventions added or left out have effect on learning combined with the internal conditions of the rule-based and the open simulation game.

Keywords

Facilitation · Intervention · Learning effectiveness · Debriefing · Reflection · Instructional design · Rule-based simulation games · Open simulation games

Learning objectives
You will be able to:

- learn about the results and conditions of the positive and the negative case study to design a contextualized facilitation approach for your simulation game.
- reduce extraneous cognitive load—ECL—(distraction from the learning goals) and increase germane cognitive load—GCL—(energy directed at the learning goals) enhances learning effects of SGs;
- optimize the introduction and phase before the start of the game so participants are well-prepared to learn from the simulation game;
- design learning loops to optimize learning from experience during the gameplay, in time out reflections and structured reflection and debriefing;
- design your interventions around agency (experience of players they have influence on what they are learning) and motivation of participants so they want to learn from the game and are not surprised if they experience frustration during the gameplay and show learning resilience.

5.1 Introduction

In this short introduction, we summarize the main findings from the theoretical chapter on facilitation interventions to increase learning in simulation games (from now on we will use the abbreviation SGs). This is useful input to understand and analyze the case studies described later in the chapter and to relate to your own work practice as facilitator and/or designer of SGs. In summary (see Chap. 4), facilitators can choose from two strategies to enhance learning in simulation games:

I. **Reduction of extraneous cognitive load** (ECL meaning stimuli from the game environment that distract participants from their learning). In systemic terms, this is called *attenuation* (see Ashby's law of requisite variety in Chaps. 4 and 7). By reducing ECL with facilitated interventions, learners can focus more on their learning goals.
II. **Developing skills of participants**. In systemic terms, this is called *amplification* or in normal English adding to the repertoire of participants to learn and deal with challenges (see also Ashby's law of requisite variety in Chaps. 4 and 7).

Both strategies contribute to motivation and agency, another important factor in learning (Deen, 2015; Harteveld, 2011; Lee-Kelley, 2018; Tieben, 2015; Watt & Smith, 2021). Via reduction of ECL participants can 'see the trees from the forest'. And via skill development (as in decision-making skills, reflection skills, learning to learn) participants can deal with the challenges they are offered and add to their learning repertoire as well as enhance the development of their frames of reference. Frames of reference are the 'mental models' participants bring into the game based on their previous experiences and knowledge. Participants experience more agency and motivation if they feel the self-efficacy (the participant has a feeling he or she can achieve the goal), they understand what is expected of them in learning from simulation games and when they receive personalized feedback on their actions (for extensive academic sources, see Chaps. 4 and 16).

For more information on resources behind these interventions, see the previous Chap. 4. A summary of possible interventions aimed to enhance learning is provided in Table 5.1.

Table 5.1 Overview of types of facilitated interventions to reduce cognitive load and increase germane cognitive load

-GCL. Types of interventions		Description	Attenuation or amplification	Sources
Types of interventions before the gameplay mainly aimed at reducing ECL Interventions of the facilitator aimed at reducing cognitive load that do not contribute to learning so participants can increase their GCL				
I.	Buy into interventions	Actions of the facilitator that contribute to the participants accepting the facilitator in his or her role, accepting the simulation game and accepting the learning environment as a whole including the other participants	Attenuation	Inductive developed concept developed based on 10 case studies, De Wijse (2015–2021)
II.	Team building interventions	Any kind of activity that is oriented toward group development, so the group is	Amplification and Attenuation	Team building sources in general Lacerenza et al. (2018) and functional role

(continued)

Table 5.1 (continued)

-GCL. Types of interventions		Description	Attenuation or amplification	Sources
		functioning as a team in the GS, for instance having a group activity in which participants get to know each other, a role division activity		division Vennix (1999)
III.	Framing interventions and establishing a learning contract	Framing is a technique that is aimed at enhancing relevance and meaning of the learning goals in relation to the simulation game	Attenuation	Fanning and Gaba (2007) for framing in training and development (Anderson et al., 2014; Frank & Scharf, 2013; Laycock & Stephenson, 2013) for establishing a learning contract
III a.	Framing intervention for expectancy guidance	Questions on expectancy guidance are an example of a framing intervention that simultaneously establishes a learning contract (taken from 3 case studies De Wijse, 2015–2021) what do participants expect; 1. Toward the session.2. Toward the SGs, 3. Toward the facilitator, 4. Toward each other	Attenuation	General sources on expectancy in relation to training Eccles et al. (1998), Plass et al. (2015), Sweller et al. (2007)
III b.	Storytelling as intervention during introduction	Storytelling is making use of a narrative to bring logic in information transfer, when used in introduction the scenario, roles, rules and resources can be connected in a meaningful way for participants who need to learn to play the game	Attenuation and Amplification	Kickmeier-Rust et al. (2011)
IV.	Frontloading intervention	Frontloading on roles, frontloading on learning from SGs,	Attenuation	Fanning and Gaba (2007)

(continued)

Table 5.1 (continued)

-GCL. Types of interventions		Description	Attenuation or amplification	Sources
		frontloading on the content of the simulation game, so people know what to expect and so they can plan for actions in the game in line with their ambitions and learning goals, this reduces ECL and increases GCL		
V.	Goal setting intervention	On a personal level, the translation of personal goals toward goals in the gameplay	Attenuation	General sources on goal setting Arraya et al. (2015), Fandt et al. (1990), Garcia-Marquez and Bauer (2021), Kolfschoten and Rouwette (2006), Nebel et al. (2016), Plass et al. (2015)
VI.	Phase Zero intervention	Have the participants prepare before the gameplay on how they think they can achieve their learning goals in the SG, some teambuilding if there are teams and the teams goals in the SG	Attenuation	Nakamura (2021), Janich (2016) provide a more general description
Types of facilitated interventions during the simulation game and in time outs				
The facilitators focus of interventions in the gameplay phase is to attend to signs of unnecessary ECL and stimulate skills that contribute to achieving learning goals (learning to learn, reflective skills, decision making skills and communicative skills)				
VII.	Reflection time outs intervention with individual, group and organization levelling to attend to dysfunctional variety and focus on learning goals	'Red thread' reflection with open questions, relations personal learning goals to (role)group and organizational goals/sustainable survival goals Pre structured reflections basics 1. What went well? (encourages to find positive learning)	Attenuation	Lee-Kelley (2018), Yang et al. (2018)

(continued)

Table 5.1 (continued)

-GCL. Types of interventions		Description	Attenuation or amplification	Sources
		2. What needs improvement? (encourages to find leverage points for learning) 3. What do you need from yourself and from others to achieve your goal (s)? (encourages to reflect on a third order level to see how one can add value and what is needed from others		
After the simulation game The facilitators focus of interventions in the gameplay phase is to attend to signs of unnecessary ECL and stimulate skills that contribute to achieving learning goals (learning to learn, reflective skills, decision making skills and communicative skills)				
VIII.	Structured interactive debriefing reflection is a proven method for increasing learning effectivity	We suggest to debrief from individual level, to role group/team level to simulation game (organization) level and transfer to reality. Everyone can contribute this way and relevant matter is sifted out via this system while meaningful exchange happens in multiple cycles. We recommend using flip over sheets with pre structured questions pre written on flip over sheets or in online environments an interface that allows for individuals and teams to have a personal space in which they can add their own learnings and reflections	Attenuation	General sources on debriefing structures Fanning and Gaba (2007), Fraser et al. (2018), Keiser and Arthur Jr (2021), Raemer et al. (2011), Tannenbaum and Cerasoli (2013), Wang et al. (2011)

In the case studies in paragraph 3, these interventions together with the interventions on interaction level (first order, second order and third order) are discussed in relation to the learning effects. In addition to this generic approach to intervention design, your facilitation approach should also always be contextualized (Tsoukas, 2017). This is not a contradiction but a useful adding. We offer you contextualized case study examples in this chapter to learn how contextualization is necessary and adds value. Research tells us (Deen, 2015) we need different approaches for participants with different backgrounds such as.

Experienced participants that have more well-developed schemata require a more elaborate briefing, framing and frontloading (explaining on the meaning of the components of the SGs such as roles, the learning process etc. in the larger learning context) as opposed to, for example, students without relevant working experience. The less experienced the participants, the shorter the introduction should be, because then there is more time needed for making the translation from the learnings in the game toward learning goals because participants still need to develop their schemata during the simulation game to understand what is relevant (Klabbers, 2009; Lukosch, 2018).

1. If participants are used to work together, team building can have another setup then in the situation where participants do not know each other yet. For instance, participants that know each other do not need elaborate introductions but they need sharing of personal goals. If participants do not know each other, a short activity that helps them go through the norming, forming, storming phases (Tuckman and Jensen, 1977) can aid so group dynamics won't generate distracting cognitive load in the gameplay.
2. Participants that are used to learning from SGs/learning from experience in an interactive way often respond differently to learning from simulation games because they know what is expected of them (please do check their expectancies and experiences regarding the types of simulation games they played before, if these were just push-the-button/test-the-system digital management games they need to be prepared for the type of social interaction in relation to learning goals they are going to experience in your specific simulation game context if this is a different kind of experience). We do expect you to organize interaction and reflexivity on top of providing just a game simulation interface because by now having read through this book you know providing the interface is not enough to optimize learning.
3. Other influenctial factors from the context of your participants might impact outcome as well such as in organizational change the level of urgency can influence motivation to want to learn from the game play. Framing within the larger context as intervention can become important to establish relevance and meaning.

The game is intended to get the best behavior out of the participants, instead of just trapping them in their (normal) ways of behaving. In certain rule-based simulation games, the autonomy of participants may be restricted in such a way they also receive limited feedback and have limited options to follow their own learning path and experiment. It is helpful to analyze what restrictions a simulation game

contains and how this may affect the learning interventions needed from a facilitator. A rule-based simulation game for this reason might need more interventions aimed at reflection in learning to move beyond the 'good or bad' feedback mode so participants understand the reasons behind the feedback from the simulation. A basic condition for any type of learning to occur is that participants need to be able to develop their schemata and for this to happen a certain connection to their original schemata and experimentation options are necessary (Leigh & Spindler, 2005; Lukosch, 2018). We discussed theoretical implications and input and research on facilitation design in Chap. 4. Now it is important to study how this relates to practical case study examples with the following research question:

> How can a facilitator contribute to the learning effectiveness of SGs via facilitated interventions aimed at learning skill enlargement, reduction of ECL and increase of GCL?

However, theoretical outcomes do not necessarily match practical outcomes, or in scientific terminology, the design science does not automatically match the analytical science. Design science here means the intervention SG as intended situated in contextual specifics that influence outcome, analytical science here means the outcome of SGs in the form of a causal theory that can be generalized and holds truth over different contexts (Aken, 2004). It is important to discern analytical science from design science in this context because both do not always consistently apply to simulation games and both show a different perspective on simulation games. Outcomes of simulation games should therefore be studied in context and sometimes causal relationships can be drawn for instance between interventions of facilitators and learning effects with participants but this does not mean this causal relationship will hold over all those different contexts simulation games are used in. For instance, if interaction is important for experiential learning and participants are not used to interactive learning, they might become passive even if a facilitator executes all kinds of interventions to optimize interaction. So the design as intended does not always automatically produce the supposed outcome and contextuality is key also from an analytical science perspective trying to uncover causality.

In a rare qualitative study on application of facilitation strategies by Nguyen et al. (2020) in a medical simulation game context results showed facilitation strategies were similar across different simulation game contexts. So far in our research, we find it possible that on a meta level similar interventions can be discerned, while their practical outcomes differ considerably and are highly contextualized. So, we use the best of both worlds; the analytical sciences for their hypothesis and causality and the case studies for the contextualized and action-oriented design sciences perspective. Since an intervention as intended does not necessarily resemble the outcome so we have to remain careful and after having developed a meta theory to contextualize it to specific practice (Tsoukas, 2017). We need more research from a practical point of view to draw conclusions if theory (as intended) and practice (as the real outcome) are aligned and consistent enough to find if the answers to the research question hold truth on a meta level across different simulation game contexts.

5.2 Methods

To answer the research question, qualitative case studies are suitable as there is a research gap with respect to the effects of facilitated interventions in SGs (Lukosch, 2018; Mayer et al., 2014). Due to the lack of research in this matter and the inherent complex nature of SGs (Bekebrede et al., 2015; Klabbers, 2018; Lukosch, 2018; Raghothama, 2017), it makes sense to first conduct explorative qualitative research. The case study data consist of interviews, observations, recordings and documentation that provide in depth, contextual information on (not) learning of participants in gameplay, reflections and debriefing from which we can derive case study descriptions that aid in answering the research question (Table 5.2).

The case studies allowed for research in action. I as a researcher was able to ask interview facilitators and participants before the gameplay and had access to additional relevant documentation. In addition, the researcher could ask questions during gameplay and after debriefing on the rationale of the facilitator and participants. The observing researcher avoided talking to the participants as much as possible to avoid contamination of the research material. Any exchange potentially influences learning and hence should be avoided. The best possibility to research and understand a social system is to perform real-time observation (Denzin & Lincoln, 2008) so we can provide answers directly from experienced facilitators in the field.

For case study selection, we followed the example of Miles & Huberman and selected studies that were at opposite ends of positive and negative learning effects. One of the selected case studies was an open simulation game in which participants learned extensively and were positive on the results. The other case study was a rule-based game simulation session that resulted in limited learning results. The extreme case studies can illustrate how facilitation can enhance learning and how if facilitation is not adequate it can impede learning. Also, the choice for deliberately choosing a rule-based and an open case study can contribute to finding factors that explain the difference in learning result. Miles et al. (2020) refer to Judd, in which Judd state standardization of case studies does not come from their systematic analysis. Swanborn (2010) advises to use critical cases to discover the difference in outcomes. We selected these case studies from a list of 18 case studies collected and documented from 2015 to 2021.

Both case studies took place within the same commercial company, in both case studies, different management layers were involved. In the rule-based case study, new employees were involved, in the open case studies, all employees were working with the company for at least 5 years. Two case studies were studied within the same company were deliberately selected, the purposes of the case study were similar, namely in both the aim was employees were required to learn the new ways of working within the new agile structure of the company. The case studies were not related. The researcher coincidently could gather two case studies within the same organization 2 years apart. It is interesting to see how results differed in the rule-based setting as opposed to the open simulation game setting. In the open

Table 5.2 Case study background information table

	Company	Participants/facilitator characteristics	Gameplay and reflection time	Game structure, roles, scenario
Case study 1 Open simulation game	Telecom company	12 employees of telecom company More than half had previous game experience	3 game rounds, 3 reflections including plenary debriefing, total of 5 h	Low in parameter value because of no specialized tasks within departments and only role
		Facilitators (external consultants familiar with the organization) one male one female aged end 40, both 10 years of experience in facilitating games	Introduction time approx. 25 min with sheets with pre structured reflection Debriefing time 40 min with extended voluntary debriefing (because participants kept exchanging experiences in the bar)	Dependencies between the 3 different departments, no procedures or forms present, use of a building metaphor
Case study 2 Rule-based simulation game	Telecom company x (case study at the same company as case study 1)	10 New employees of telecom company x 2 with previous game experience One facilitator aged 55 (free-lance consultant, former employee of the company), 10 years of experience in facilitating games	3 game rounds, 3 reflections including plenary debriefing, total of 5 h Introduction time 1,5 h with sheets No pre structured reflection Debriefing time 20'	High in parameter value because of specialized tasks of the roles in the departments, and between the departments. 3 different departments, specific rules and procedures per phase and per function, use of a technological metaphor

* Parameter values in the table refer to the matter of complexity of the game structure stemming from socio technique discussed in Chap. 4

simulation game, the researcher was asked to guide a design process for a custom-made game with a consultant company that had been working with the company for over 12 years. The consultants provided input on the organizational structure and what the model of the simulation game should consist of. This was translated into a more abstract game model to optimize the learning. It was intended as being recognizable enough to experiment with new behaviour in agile working.

The open SG contained as few rules as possible resembling practice, just roles were divided, and similar tasks would be performed in the client organization. There were no tricks or other types of extras hidden in the open simulation game, it was purely a representation of their new working conditions taking place within a metaphor on an abstract level. The researcher had the opportunity to witness the game session and play a role within the scenario if she wanted to find out what was happening in the simulation game. Before, during and after the simulation game, the researcher interviewed the two facilitators on intentions and outcomes.

The case study data collected consisted of transcripts from the rule-based game and written interviews, the data in the open simulation game were recorded and transcribed and the interviews before and after were transcribed as well. All participants and facilitators in both case studies were informed of the study during the invitation. Again, at the introduction at the start of the game, they were asked if they had any objections toward the research as part of a PhD study at Radboud University and the presence of the observer. It was explained that all transcripts would only be used by the researchers involved and that all used transcripts, material and results would be anonymized. All agreed to the study.

5.2.1 Case Study Outcomes

In this paragraph, results from case studies, interviews with facilitators and literature study are discussed. Findings that contribute to the research question are highlighted. We selected thematic quotes from the cases and interviews and used available literature to further illustrate the relevance.

5.2.1.1 Simulation Game Description Used in This Case Study

The aim of the organizational change project was to change the company culture from a bureaucracy into an agile organization to meet changing demands from the environment. An organizational structure change had taken place; however, the organizational culture existing before this change undermined the new structure and its cooperation. A series of nine sessions of this game were conducted first with the management, later with mixed groups that all attended a training program containing this game. Five facilitators were trained to work with this game. All sessions had similar outcomes regarding conclusions drawn and lessons learned. One specific session is described here that took 4 hours of playing time and three playing rounds with a debriefing. In total, the intervention lasted from 9.30 in the morning to 16.15 in the afternoon. 17 people participated in this session, one female and the rest male. The facilitators consisted of one female and one male consultant from an external consulting company. Most participants expressed they had played games before, also with the consultants involved. The scope (handling space) was comparable to the scope participants had in practice, they were free to experiment and make their own decisions because there was nearly no hierarchy (just one informal layer) and there was extensive autonomy. Rules were absent except for the fact that one was assumed to be a team player and take responsibility for his or her acts.

The distance (how participants perceive the meaningfulness and relation to their real work) was experienced being low meaning that the participants recognized the relevance to their daily work. Participants quickly connected to their roles and recognized the reality they faced and related this from round 1 to their working practice.

5.2.1.2 Chronological Description of the Introduction, Gameplay and Debriefing of Case Study 1

The female facilitator conducted the introduction and she had approximately 12 sheets prepared, they were built up in a specific phased in following order.

Phase 1, general introduction of the aim of the game in the larger organizational culture change programme, was meant as a framing intervention. Phase 2, introduction of the game (with three levels of frontloading) metaphor and roles including a description of the processes in the game while explaining this, was their future organizational structure with as few rules as possible as in reality in their organization. They aimed at proactive, communicative, team-oriented behaviour that was part of an agile way of working with regular quick meetings involving all stakeholders including customers. There was frontloading on the role explaining some roles in the game would require more activity and were more challenging. Participants could choose their role themselves as much as possible. There was frontloading on the use of the metaphor of the game and the game's structure. In addition, there was frontloading on the process and content of the game, what was the aim in the gameplay and what result was expected in the form of satisfied customers and efficient cooperation. The aim of this intervention was to have participants choose their own roles after they knew what the roles contained, so this could add to experiencing agency for their actions.

Start of phase zero with team building, goal setting on individual and group level

After the introduction, a few questions were asked and then phase 0 was started. Participants could read about their role, deliberate with their teams on their aims and part two of this phase 0 was goal setting on their personal aim in the game and write these on a role group flip over. The facilitators checked if everyone was ready, one question was asked (so there were very few unclarities at the start of the game and all had sufficient preparation time) and answered and then started the first game round, providing participants ca. 30 minutes for the gameplay. Team building had already taken place in the preceding training program before the start of the simulation game.

Gameplay

The participants immediately started playing their roles, some were more outgoing in making contact with the other roles and some remained calm observing, asking an occasional question to the facilitators.

Reflection time out after each game round

After round 1, the facilitator called a time out with guided questions and asked teams to reflect within their role groups on their personal goals and the goals they had in the game with the questions 'what went well, what went not so well and what do you need from yourself and from others to improve?' written on to a flip over, and participants were told they would repeat this timeout procedure after the second game round.

The groups stood around their flip overs and discussed what happened and exchanged their different points of view, their learnings and assumptions and their ideas for solutions. They also found they made assumptions and thought they had understood what the others were doing. Participants often were a bit disappointed in feeling that their ideas were not adopted, and some expressed they had waited for others to come to them to ask for information. From an intervention perspective, this reflection enabled reduction of useless variety by focusing on learnings and exchange and it enabled participants time to learn and reflect with each other enhancing their skill in dealing with the challenges in the gameplay.

A short discussion followed on how different roles were performed and what the roles needed from each other to have added value. The second round was played and another similar time out was conducted in the same way and delivered the insight that it was frequently observed that participants unconsciously added dysfunctional unwritten rules to the roles they performed. Some thought they had to wait for orders, others thought that they would receive information, others thought that certain actions had already been performed by others and that these actions were not part of their roles. Customers played by facilitators in the gameplay had not had the contact and confirmations they were looking for and felt neglected. All the roles responded a bit frustrated; they perceived they worked really hard and had met customers' needs while customers receiving the end product were surprised sometimes in a negative way by the outcome. The central conclusion from round 2 was, that they were still behaving in a bureaucratic way inventing their own rules and having much too less contact with each other. They expressed 'we are even doing this in a very simple game containing few roles and rules!'. Here the valley of despair set in. Valley of despair is a known phenomenon in SG, this is a period in the gameplay in which frustration usually precedes learning. The level of frustration causes participants to take a learning leap and try new behaviour see (Wenzler & Chartier, 1999). The valley of despair appeared because participants had worked hard but did not receive the positive result they aimed for. Their customers were not satisfied with the communication and did not feel involved and happy with the end result. 'The dysfunctional behaviour is not timely recognized by us' they stated, 'we need to start behaving more communicatively and proactively and we need to be discussing our behaviour and checking for feedback on the process with the parties we work with'. In the third and final game round, the participants had the opportunities to experiment with the new behaviour (more contact, more feedback asking on the process) and noticed this worked a lot better. Here they organized their own learning loops in the process. They seemed quick at letting go of their own self

invented rules and assumptions and also expressed during the gameplay 'I will do this now differently, I will more regularly contact the customer directly and ask for feedback'. It helped that they got quick feedback on their actions by the feedback they organized themselves in the cooperation process.

Debriefing

The debriefing served as a wrap up (this was possible because the in-between time outs already covered a lot of learning and served as a red thread of learning in chronological order following the game developments over different game rounds). First, the role groups would gather around their flaps and were asked to reflect on their journey through the gameplay by looking at the flaps with pre-structured questions they made in the previous rounds and drawing some final conclusions which they would share in a plenary session. The game was very immersive to them so after discussing these results, the facilitators added an extra debriefing after a break to talk on their game learnings with reflections to their realities and what it had meant for them personally. There was much motivation to contribute to this discussion and also the facilitators added extra behavioural observations because there was still a lot to discuss on what happened in the game with enthusiasm and satisfaction on the final result.

Analysis of case study 1

The buy-in in this case already more or less happened before the simulation game. All participants knew the trainers well because this was the third training day in the second block of four blocks of training within an organizational change trajectory. The introduction of the facilitators started with the why of the simulation game and a short explanation on how learning can happen in SGs via experimentation and sometimes also frustration. The facilitators asked the participants on their previous experiences with SGs so they could manage the expectations toward this fairly open form SG. They were asked to behave like they would normally do. Goal setting, frontloading, framing and expectancy management were naturally integrated in this short intro with sheets of 15 mins. The introduction by the facilitator prepared participants well, they understood how to act in the simulation game quickly. Because they had an introduction that shared the goals of the game, the goals in the game and what roles were present. Also, they could choose their roles adding to their feelings of agency. The participants already knew the facilitators and this probably explains at least partly why they accepted the facilitators and the information provided soon and went to work without questioning. The preparation phase 0 gave them an opportunity to prepare and form a team, they were asked to relate their personal goals to the team goals and prepare for a cooperation strategy in the first round of the game. The participants already experienced motivation and agency at the start of the simulation game because of the successful buy into with the facilitators in combination with the introduction and preparation they had. The open simulation game did not raise many questions with participants, they immersed quickly and accepted the game model. Also, because they all worked for the same company, they were already familiar with the company's culture and

recognized quickly the traps they created for themselves. They behaved naturally which caused them to reflect for the first time on how functional this behaviour was in the light of their learning goals. This reflection started quite early on in the game. Probably, this can be explained by the fact that they knew each other fairly well beforehand, they already developed a constructive learning atmosphere in the group and in connecting to the facilitators. They all had been working for the same company for numerous years and therefore were able to quickly recognize the same dynamic happening in the simulation game. They accepted the fact that they recreated this dysfunctional behaviour themselves because they were offered a simple task within a simple organization structure that resembled their new ways of working. The learning early in the gameplay enabled them to maximize their experimentation and hence they learned about what worked and what didn't. This was further catalyzed by the regular time outs with guided reflections and debriefing organized by the facilitator. They carefully build up reflections on their goals from the start. From an individual level, to group, to organization level so debriefing served as a closing final learning loop and wrap up, so they moved effectively through the valley of despair which helped them to change their assumptions and behaviour. They were not distracted by extraneous cognitive load and could focus on their learning and reflection from the start both in the gameplay as well as in reflection and debriefing. The debriefing could serve as wrap up with some clear learning goals to keep for the future.

5.2.2 Case Study 2 Description with Applied Interventions for the Rule-Based Casus Introduction for New Employees

Simulation game description used in this case study

The rule-based simulation game contained a metaphor with a high distance for the participants (the metaphor used was not recognized as meaningful and relevant by the participants) and a low scope (they were assessed on how well they could follow a certain procedure). Participants were told how to behave in the introduction, but they were not able to make the connection to what this meant for behaving in the SG). The participants engaged in the gameplay while they were part of a new employee introduction program. The participants had not cooperated before and a few of them (2 out of 14) had played one or two SGs during their education. The educational level on average was applied university, and the average age was around 35 years old. The game including introduction was conducted from 9.30 to 16.45 in the afternoon. Each role was performed by a team consisting of three to five people having separate functions though they were expected to cooperate. They had to make use of rules and procedures provided in the game with every decision they could make.

Introduction, gameplay and debriefing description of case study 2

The facilitator did not know the participants beforehand and was just hired to perform this game on 1 day during an introduction program. During introduction, participants sat, listened and asked an incidental question. In addition, the facilitator shared the aim of the game framing in the programme 'to become acquainted' with the ways of working in the organization. Some team building activities during a social program would take place in the evening. There was no choice in who would perform what role, the facilitator appointed people based on his estimate that, at the director's function, there should be some people with analytical skills. There was no phase 0 in which participants would reflect on how they would take up their roles.

The role division was assigned by the facilitator (no adding of agency because of participants not being able to choose their own roles). Participants had an elaborate introduction into the processes and procedures they needed to manage. The participants had no previous working experience in the processes offered to them.

Gameplay description

When the participants played several game rounds they started noticing that it was hard to cooperate when not knowing what the actions, information and role responsibilities were of the other departments outside their own *(ECL)*. They were not aware they should share certain information at certain times to keep processes going. Frustration arose both among participants and the facilitator *(signs of the valley of despair setting in)*. The facilitator intervened extensively on content and procedural rules, showed each department what forms they had to use and how they had made mistakes before by not writing down and sharing certain information *(ECL sign by facilitator followed by purely content and procedural interventions aimed at understanding how to play the game)*. The participants tried to work with the instructions and went to look for information and ask other departments on their procedures. Three participants regularly asserted (while the others around them were nodding) 'we do not know what to do, we do not know what information to share to who and when, we do not understand the roles of the other departments because we do not understand our own role' *(ECL caused by the organization structure which was bureaucratic and procedures/forms/terminology in the game)*. While they were checking up with their 'colleagues' from the other departments they shared their frustrations and tried to understand what they had to do. After a while eight of them gave up and did no longer actively engage in the gameplay. This resulted in a few people trying to make sense of certain procedures and exchanging some information while others kept being lost in their roles and the learning goals they had for the simulation.

Some of them kept asking the facilitator for directions until the last game round started, the facilitator conducted additional content interventions and showed the participants what to do by taking the forms and walking around with them to other departments and pointing at what information needed to be written where. Two persons in the simulation game talked about their frustrations while others became desperate and expressed personal anger also based on previous experiences in their

former working life *(internal cognitive load with potential personal bias to the current situation)*. 10 participants seemed to remain in the valley of despair behaving mostly inactive only uttering frustrations and not being able to deal with the instructions they received from the facilitator. Two persons remained calm *(these two had played SGs before during their education)* and kept experimenting. One of them also reflected aloud on what he saw happening (both had a different cultural background, this may have helped them in behaving more adaptively in this new challenging situation). Some started talking on the evening program that was going to be a social program. Then an extensive time out started with the facilitator explaining aloud what was happening in the simulated environment and what needed to be done in the next round. After 20 minutes he expressed that 'I am going to help the directors and you can approach me here if you need help'. The next 20 minutes the facilitator explained the procedures to the directors and worked closely with them from their table. The facilitator incidentally made remarks on how he perceived the process was developing in terms of it being chaotic and that participants did not execute the game rules well enough. In the meantime, one of the groups approached the observing researcher expressing again their frustration and that they did not know what to do *(valley of despair)*. In the last round, one department was active and the other departments just watched. They took on the role of distributing information and forms to everyone and telling what needed to be done with them. In the last round, some forms were filled out by a few.

Debriefing

Debriefing started. Participants sat down and the facilitator explained what happened in the simulation and that they did a lot better than in the previous round (which was not really true, the facilitator chose to do this because some improvements were made and he did not want the group to feel negative after leaving the SG). The participants sighed with relief and were sitting down not talking and just listening passively. The facilitator mainly talked. Only one of the participants responded enthusiastically on what he had learned and seen happening in the gameplay, that it was just like a real company and that he had seen the importance of the activities of the department that became active in the last round. He also expressed that he found it difficult to cooperate and be proactive. He realized he had to go out more to communicate instead of waiting and sitting and complaining. After the debrief, they went for the evening social programme.

Analysis of case study 2

Two main factors were most likely impeding the learning in this case. First, the rule-based simulation game containing pre-structured procedures, rules and terminology taking place in a metaphor (that was experienced as far from the participants reality, they could not relate to the metaphor used) distracted both the participants and facilitator from learning and applying effective learning interventions. The facilitator only used very few facilitated interventions to optimize learning. The unstructured preparation, the unstructured time outs and the unstructured debriefing did not aid participants in learning.

The buy in phase was overlapping with the introduction. The participants did not know the facilitator before. They perceived the facilitator as passionate about the simulation game and patiently sat out the 1.5 hrs introduction in the morning accompanied with theory and game setup introduction on sheets. There was frontloading on the content and procedures of the game and theory on what behaviour was wanted on an abstract level within the game metaphor. This can be considered as partly framing and frontloading because participants were new to the organization and did not have a frame of reference yet to connect the new information. There was no personal goal setting. There was no phase 0, no expectancy management toward previous SGs' experiences. A question was asked regarding what games they played before, but the facilitator did not ask about the experiences or drew comparisons toward the game they were going to play.

During lunch, a participant left. The rule-based structure probably played a role in participants making mistakes and developing frustration on not knowing what to do. The new processes, the roles they had to take in following procedures they could not understand and hence they made mistakes. Although the facilitator made extensive efforts with over 65 interventions on content and procedures to make them play the game as intended, he did not succeed. The participants were not able to learn from the game because even though they received first-order instructions. The SGs extensive rules and procedures impeded their learning and cooperation because of the internal complexity of the game. The participants suffered from the disturbances (ECL) derived from the rule-based structure of the SGs, which impeded them from receiving sufficient, adequate and timely feedback. The structure further led to alienation, loss of motivation and less feelings of agency. Also, the interventions of the facilitator did not contribute to their learning (see publication on learning effects in qualitative and quantitative outcomes of this specific case study publication expected 2023). They could have realized this and then invented their own approach and experimented with it if this would work. Instead, they got frustrated and unmotivated, maybe fuelled by many interventions of the facilitator they could not attend to, and which possibly contributed to more external cognitive load lowering GCL. The two participants that remained active finally got the hang of it and went through the valley of despair by trying out new approaches and combining with communicating to others on what they thought was needed. Because the debriefing was unstructured and the facilitator did the vast majority of the talking and asked mainly rhetorical questions, only a few learning comments from the participants were made on a meta level. There was no specific translation to their future working conditions. The debriefing took only 15 minutes and did not serve as a summary with highlights of the learnings of the simulation game. The facilitator mentioned a few observations and told the participants they were doing a lot better in the last 45 mins. The participants were interested in knowing what that 'better' had meant because the majority of them still remained lost in the fog. Only three people were active in the last 45 min.

Central impediments/enablers for learning derived from the case studies

In a simulation game, challenges are directed at participants to learn from. If these challenges are not aligned with the learning goals and/or personal learning aims of the participants, they can become impediments for learning. Here the impediments are shortly explained, they are explained more elaborately in the discussion and conclusion.

1. **Game (Organizational) structure disturbances**

As explained in the introduction, the internal complexity of the game's structure can cause impediments for learning because of delays in feedback, lack of autonomy, agency and motivation leading to less learning.

2. **ECL challenges**

These consist of all distractions that do not contribute to learning, for instance the participants find the facilitator annoying, the participants are irritated because of not understanding game instructions and materials.

3. **Valley of despair**

The valley of despair can work both in a positive and in a negative way, negatively if participants get stuck in the valley and do not find ways to enlarge their skill. Positive if the valley provided them with opportunity to learn from, when the participants receive negative feedback on their performance by the game model and/or facilitator and they are able to find new strategies and experiment their way out of the challenges. If this is the case, they have learned new skills they did not possess or applied before.

4. **Expectancy and (cultural) bias challenges**

Participants bring their own culture into the game potentially impeding learning because they behave according to their ideas on how to fulfil a role. If they remain in familiar behavioural patterns, they miss opportunities to experiment and learn from the gameplay.

5. **Designed learning loops**

SGs' added value should come from the opportunity to act and experiment in the gameplay. Learning loops can be pre designed into the game and time outs so participants are allowed multiple learning cycles and opportunities to learn from the SG. Sometimes the level of immersion can impede learning because participants fail to take time to reflect and learn from feedback making pre designed learning loops during gameplay and reflection necessary. Pre-designed learning loops for instance in the form of added reflection moments after the gameplay can add to the learnings and remaining overview on the participants' learning process.

In Table 5.3, the two cases are displayed side by side regarding the potential impediments/enablers for learning.

In Table 5.3, the central issues arising in many SGs are mentioned in the left column. These are issues that need to be addressed by facilitation for instance by generating learning loops enabling participants to enhance their GCL by focusing on their learnings and reduction of extraneous load by leaving out irrelevant findings, while simultaneously investing in enhancing their skill level to deal with the challenges from the game.

Comments on the number of learning loops per casus

In the rule-based casus, facilitated learning loops consisted of the time outs. However, the intended effect of the time out on reflecting and learning was absent because the facilitator talked and asked nearly no questions. In addition, the facilitator also focused attention on content and procedure and not on learning goals, role reflections and participant analysis of what happened. This behaviour of the facilitator impacted the learning opportunity in a negative sense. The rule-based characteristics of the simulation game make the role of the facilitator in enabling and facilitating learning even more needed for participants to gain overview, focus on learnings and make sense of the events from the gameplay. In a publication by de Wijse-van Heeswijk (2021) explanations are provided how it is possible rule-based simulations with high structural complexity inhibit learning. Shortly summarized a complex internal structure with dependencies generates less and slower specific feedback on the actions of participants. Less feedback opportunities combined with limited autonomy or handling space decrease conditions for experiential learning. Because for experiential learning to be optimized short cycled phases of action, reflection, analysis and conceptualization need to take place. If both autonomy and reflection inhibit learning from feedback, chances of learning are lower. A facilitator then needs to make opportunities for reflection and provide feedback for instance during time out reflections.

In the open simulation game, a number of learning loops were previously designed (these could have been applied in the rule-based case as well, this is not dependent on the type of simulation game). The added time outs supported the participants in reflecting on their previous experiences in the gameplay and making new plans related to their learning goals in the next game round. The debriefing could serve as a wrap up and was focused on clear outcomes. As a result of the phase 0 before the start of each game round, the most relevant learnings are shifted and focused within the role groups and later shared in the plenary session, GCL was optimized in this phase. The pre-debriefing within the role groups (pre-debriefing within mixed role groups could even attenuate more variety) allows for sense-making among the role group first before sharing in the central group, this reduces ECL (unnecessary variety) and increases GCL.

Table 5.3 Examples of impediments/enablers for learning

Impediments/enablers for learning	Rule-based case study	Open case study
1. **Game (Organizational) structure disturbances**	Present	Absent
	Participants complained during all rounds they did not understand the rules, procedures, and dependencies. Numerous questions were asked on game content/procedures and the facilitator performed a large amount of content / procedural interventions	The participants took on their roles quickly from the start and started experimenting with different behaviour. No questions were asked on terms, rules, procedures
2. **Extraneous cognitive load**	Present	Absent
	Participants experienced severe pressure from understanding the game impeding them to play the game as intended	Participants had no comments on external factors such as not understanding the game or other external factors
3. **Valley of despair**	Present	Present
	Participants could not make sense of the content/procedural interventions by the facilitator, the majority became passive and discussed in small group show they experienced the frustrations from not understanding the game, they also shared this in the time out reflections. In the end three participants started to facilitate their own learning (emergent facilitation, when participants start facilitating their learning processes themselves) by actively seeking feedback amongst each other mainly in the last game round	After the first game round the participants realised they were not going to reach their learning goals if they remained doing what they did. They planned for some new strategies. At the second time the participants realised that what they were doing was not delivering them the result they wanted and they tried some new behaviour based on the feedback they had resulting in a debrief in which they realized they had found many new solutions they hadn't realized they needed. Behavioural changes were made during the game and with enthusiasm and relief the participants left the debriefing and kept talking about what had happened and how this helped them to realize what they needed
4. **(Cultural) bias**	Present	Present
	Because these participants were new to the organization only their own cultural biases could have played a role. One participant commented on feeling in the same situation as	From the first-time out participants started noticing that their assumptions did not fit the SGAs challenges, they then started adapting their procedures and realised in

(continued)

Table 5.3 (continued)

Impediments/enablers for learning	Rule-based case study	Open case study
	before when she was not helped by teachers. The two participants that had played games during previous education showed more learning behaviour in actively seeking feedback and not staying in a passive mode, which can be seen as a positive effect because they had a different approach to learning from SGs	timeout two that this was not sufficient. In round three and during debriefing they realized they invented their own rules and that these were not functional. That it was more about staying in contact with each other and seeing cooperation as partnerships working on the same aims that needed frequent cooperative meetings as in agile projects. This was also what the facilitators aimed for, that they realized what behaviour was not functional and that they could find out for themselves how to deal with the new ways of working while letting go of the old culture
5. **Number of learning loops**	Present at least 1 observed (we cannot look inside the heads of participants if they go through learning loops themselves)	Present at least 4 loops observed
	For the three participants starting to experiment one learning loop in the last round	*Learning loop 1*: Phase zero and round 1 the preparation of the gameplay on how players would aim for achieving their learning goals and finding out how this worked in practice of gameplay
		Learning loop 2: reflection 1 and round 2 with reflection on what happened in the round and how this related to the players aims in the game and learning goals
		Learning loop 3: debriefing with transfer to reality. The debriefing phase zero was a role group discussion on the results of the final gameplay and what happened with the learning goals of the participants in the final gameplay. Then a plenary sharing was started on the findings of each group. After

(continued)

Table 5.3 (continued)

Impediments/enablers for learning	Rule-based case study	Open case study
		which a short break and a move to another more relaxed room was made where the participants were enabled to talk further on their learnings from the gameplay and the relations to their working practice and how sustainable transfer could be achieved
		Learning loop 4: Because the previous time outs provided guidance and focus for the last debrief the participants could make use of their own experiences and learnings and the experiences of the others because they had a pre-debrief in their role group and then a central debriefing. The unnecessary variety was reduced, and the focus was brought by sharing in the role groups and then sharing in the central group
		In addition, numerous learning loops were added by the participants during round 2 and even more in round 3 when they met more frequently and evaluated and reflected on in between results more often
		Nb. there are probably many unorderly learning loops happening during gameplay within the minds of the players we are not aware of and that we cannot design or measure

5.3 Summary and Conclusion

From the case studies, it is visible how adding or leaving out facilitated interventions can influence learning. Especially in rule-based SGs, the effects of leaving out adequate facilitated interventions are enlarged in a negative sense. The restrictions in agency, autonomy and as a result decline of motivation inhibit emergent facilitation by the participants themselves. The open simulation game allows for active

experimentation and pro-active search for feedback by participants themselves, sometimes making the intervention role of the facilitator less important. Especially participants with learning resilience (they keep a learning attitude in frustrating and challenging circumstances, see Fisher and Law (2021) and game literacy (skills that enable people to learn from challenging and changing circumstances that are often encountered in SGs) can facilitate their own learning path through the SG. However, from practice, it is shown facilitators often add value to learning (Leigh et al., 2005; Lukosch, 2018; Tiwari et al., 2014) in reflection and debriefing (Fanning & Gaba, 2007; Keiser & Arthur Jr, 2021; Nakamura, 2021; Raemer et al., 2011; Tannenbaum & Cerasoli, 2013; Wang et al., 2011). We can conclude a well-prepared facilitator who knows the rationale behind two main types of interventions; skill enlargement and complexity reduction can perform an array of interventions aimed at learning. If a facilitator prepares and designs reinforcing learning loops from the start, these loops can function as leverage points for learning by bringing more focus and hence motivation to learning processes as shown in the positive case study. People that experience feedback is meaningful and helpful to them in their learning process are automatically more motivated to learn.

In the case studies, we have seen examples on how multiple interventions can be integrated into one facilitation approach. For example, in the positive case study, an introduction where participants receive frontloading and can prepare for learning in the simulation game and at the same time relate their learning goals toward strategies and behaviour in the game. During reflections that occurred regularly after for instance each hour of playing time, participants can reflect on and read just their strategies in relation to their learning goals or even adjust learning goals based on improved insight. Mainly process (second order) and role (third order) learning took place, norms were adjusted leading to different processes. The debriefing could serve as a summary of learnings and allowed for time to reflect on learnings in practice. Whereas in the other negative case study, we saw learning stuck on first-order level while both facilitator and participants experienced frustration as a result alienation and demotivation set in. Most participants were stuck in the valley of despair and experienced no handholds from time outs to improve their approaches. They did not feel involved or activated in the debriefing and only a few people were resilient enough to learn from some actions they performed in the last game round. Here the lack of interventions on reducing ECL and no interventions aimed at increasing skill resulted in a poor outcome. Reflection was not effective with only the facilitator giving instructions and without having guided questions. The debriefing resulted in the same inactive behaviour with the participants.

Some Questions

What contextual issues can play a role in designing your facilitation interventions? How is it possible that designing multiple learning loops (in the form of formative assessment reflection that aids participants in relating their experiences to learning) can serve as a reinforcing learning mechanism?

How can it be explained that rule based simulation can restrict learning from experience?

Future Reading

Specific literature into what interventions generate what specific effects in the context of SGs is very scarce, this research is a starting point.

Some related earlier publications related to practical research on this topic are:

- Nakamura, M. (2021). Unpacking and Disclosing the Reasoning behind "A Structured Instruction Improves Team Performance" conference proceedings ISAGA Indore 21.
- Raemer, D., M. Anderson, A. Cheng, R. Fanning, V. Nadkarni and G. Savoldelli (2011). Research Regarding Debriefing as Part of the Learning Process. *Simulation in Healthcare* 6(7): S52–S57.

In addition, since there is a lack of research from the game simulation community other fields can provide us with useful insights.

- Tsoukas, H. (2017). Don't simplify, complexify: From disjunctive to conjunctive theorizing in organization and management studies. *Journal of Management Studies* 54(2): 132–153.

References

Aken, J. E. v. (2004). Management research based on the paradigm of the design sciences: The quest for field-tested and grounded technological rules. *Journal of Management Studies, 41*(2), 219–212.

Anderson, G., Boud, D., & Sampson, J. (2014). *Learning contracts: A practical guide*. Routledge.

Arraya, M. A., Pellissier, R., & Preto, I. (2015). Team goal-setting involves more than only goal-setting. *Sport Business and Management-an International Journal, 5*(2), 157–174. https://doi.org/10.1108/sbm-11-2012-0046

Bekebrede, G., Lo, J., & Lukosch, H. (2015). Understanding complexity: The use of simulation games for engineering systems. *Simulation and Gaming, 46*(5), 447–454. https://doi.org/10.1177/1046878115618140

Deen, M. (2015). *GAME games autonomy motivation & education*. Lulu.com.

Denzin, N. K., & Lincoln, Y. S. (2008). *Introduction: The discipline and practice of qualitative research*.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed.

Fandt, P. M., Richardson, W. D., & Conner, H. M. (1990). The impact of goal setting on team simulation experience. *Simulation & Gaming, 21*(4), 411–422. https://doi.org/10.1177/104687819002100405

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(2), 115–125.

Fisher, D. M., & Law, R. D. (2021). How to choose a measure of resilience: An organizing framework for resilience measurement? *Applied Psychology, 70*(2), 643–673.

Frank, T., & Scharf, L. F. (2013). Learning contracts in undergraduate courses: Impacts on student behaviors and academic performance. *Journal of the Scholarship of Teaching and Learning, 13*(4), 36–53.

Fraser, K. L., Meguerdichian, M. J., Haws, J. T., Grant, V. J., Bajaj, K., & Cheng, A. (2018). Cognitive load theory for debriefing simulations: Implications for faculty development. *Advances in Simulation (London, England), 3*, 28. https://doi.org/10.1186/s41077-018-0086-1

Garcia- Marquez, C., & Bauer, K. N. (2021). An examination and extension of the theory of gamified learning: The moderating role of goal orientation. *Simulation & Gaming, 52*(4), 407–434. https://doi.org/10.1177/1046878120958741

Harteveld, C. (2011). *Triadic game design: Balancing reality, meaning and play*. Springer Science & Business Media.

Janich, N. (2016). Facilitator withdrawal from organizational change initiatives: A review of strategies and guidelines. *Group Facilitation: A Research & Applications Journal, 13*.

Keiser, N. L., & Arthur, W., Jr. (2021). A meta-analysis of the effectiveness of the after-action review (or debrief) and factors that influence its effectiveness. *Journal of Applied Psychology, 106*(7), 1007.

Kickmeier-Rust, M. D., Augustin, T., & Albert, D. (2011). Personalized storytelling for educational computer games. In M. Ma, M. F. Oliveira, & J. M. Pereira (Eds.), *Serious games development and applications* (Vol. 6944, pp. 13-+). <Go to ISI>://WOS:000306582700002

Klabbers, J. H. G. (1996). Problem framing through gaming: A rebuttal to Law-Yone. *Simulation & Gaming, 27*(1), 98–102. https://doi.org/10.1177/1046878196271006

Klabbers, J. H. G. (2003). Gaming and simulation: Principles of a science of design. *Simulation & Gaming, 34*(4), 569–591. https://doi.org/10.1177/1046878103258205

Klabbers, J. H. G. (2009). *The magic circle: principles of gaming & simulation* (3rd and rev. ed.). Sense Publishers.

Klabbers, J. H. G. (2018). On the architecture of game science. *Simulation & Gaming, 49*(3), 207–245. https://doi.org/10.1177/1046878118762534

Kriz, W. C. (2010). A systemic-constructivist approach to the facilitation and debriefing of simulations and games. *Simulation & Gaming, 41*(5), 663–680. https://doi.org/10.1177/1046878108319867

Lacerenza, C. N., Marlow, S. L., Tannenbaum, S. I., & Salas, E. (2018). Team development interventions: Evidence-based approaches for improving teamwork. *American Psychologist, 73*(4), 517–531. https://doi.org/10.1037/amp0000295

Laycock, M., & Stephenson, J. (2013). *Using learning contracts in higher education*. Routledge.

Lee-Kelley, L. (2018). When 'knowing what' is not enough: Role of organised simulations for developing effective practice. *International Journal of Project Management, 36*(1), 198–207. https://doi.org/10.1016/j.ijproman.2017.08.003

Leigh, E., & Spindler, L. (2005). Congruent facilitation of simulations and games. In *Gaming, simulations, and society* (pp. 189–198). Springer.

Leigh, E. E., Daly, G. M., & Chatfield, M. (2005). Simulation facilitators as managers of the 'promise of simulation'. In *Simulation Technology and Training Conference*

Lukosch, H. K., Bekebrede, G., Kurapati, S., & Lukosch, S. G. (2018). A scientific foundation of simulation games for the analysis and design of complex systems. *Simulation & Gaming, 49*(3), 279–314. https://doi.org/10.1177/1046878118768858

Mayer, I., Bekebrede, G., Harteveld, C., Warmelink, H., Zhou, Q., van Ruijven, T., Lo, J., Kortmann, R., & Wenzler, I. (2014). The research and evaluation of serious games: Toward a comprehensive methodology. *British Journal of Educational Technology, 45*(3), 502–527. https://doi.org/10.1111/bjet.12067

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis: A methods sourcebook* (4th Ed.). SAGE.

Nakamura, M. (2021). Unpacking and disclosing the reasoning behind "A Structured Instruction Improves Team Performance" In *Conference Proceedings ISAGA Indore 21*.

Nebel, S., Schneider, S., Schledjewski, J., & Rey, G. D. (2016). Goal-setting in educational video games: Comparing goal-setting theory and the goal-free effect. *Simulation & Gaming, 48*(1), 98–130. https://doi.org/10.1177/1046878116680869

Nguyen, A. M., Cuthel, A., Padgett, D. K., Niles, P., Rogers, E., Pham-Singer, H., Ferran, D., Kaplan, S. A., Berry, C., & Shelley, D. (2020). How practice facilitation strategies differ by practice context. *Journal of General Internal Medicine, 35*(3), 824–831. https://doi.org/10.1007/s11606-019-05350-7

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist, 50*(4), 258–283.

Raemer, D., Anderson, M., Cheng, A., Fanning, R., Nadkarni, V., & Savoldelli, G. (2011). Research Regarding Debriefing as Part of the Learning Process. *Simulation in Healthcare, 6*(7), S52–S57. https://doi.org/10.1097/SIH.0b013e31822724d0

Raghothama, J. (2017). *Integrating computational and participatory simulations for design in complex systems*. Doctoral dissertation. KTH Royal Institute of Technology.

Swanborn, P. G. (2010). *Case study research: What, why and how?* SAGE.

Sweller, J., Kirschner, P. A., & Clark, R. E. (2007). Why minimally guided teaching techniques do not work: A reply to commentaries. *Educational Psychologist, 42*(2), 115–121. https://doi.org/10.1080/00461520701263426

Tannenbaum, S. I., & Cerasoli, C. P. (2013). Do team and individual debriefs enhance performance? A meta-analysis. *Human Factors, 55*(1), 231–245. https://doi.org/10.1177/0018720812448394

Tieben, R. (2015). Activating play: A design research study on how to elicit playful interaction from teenagers.

Tiwari, S. R., Nafees, L., & Krishnan, O. (2014). Simulation as a pedagogical tool: Measurement of impact on perceived effective learning. *International Journal of Management Education, 12*(3), 260–270. https://doi.org/10.1016/j.ijme.2014.06.006

Tsoukas, H. (2017). Don't simplify, complexify: From disjunctive to conjunctive theorizing in organization and management studies. *Journal of Management Studies, 54*(2), 132–153.

Tuckman, B. W., & Jensen, M. A. C. (1977). Stages of small-group development revisited. *Group & Organization Studies, 2*(4), 419-427. https://doi.org/10.1177/105960117700200404

Van Den Hoogen, J., Lo, J., Meijer, S., & Winter Simulation Conference, W. S. C. (2015). Debriefing in gaming simulation for research: Opening the black box of the non- trivial machine to assess validity and reliability. In *Proceedings—Winter Simulation Conference* (pp. 3505–3516). https://doi.org/10.1109/WSC.2014.7020182

Vennix, J. A. M. (1999). Group model-building: Tackling messy problems. *System Dynamics Review, 15*(4), 379–401. <Go to ISI>://WOS:000085273400003

Wang, E. E., Kharasch, M., & Kuruna, D. (2011). Facilitative debriefing techniques for simulation-based learning. *Academic Emergency Medicine, 18*(2), e5. https://doi.org/10.1111/j.1553-2712.2010.01001.x

Watt, K., & Smith, T. (2021). Research-based game design for serious games. *Simulation & Gaming, 52*(5), 601–613. https://doi.org/10.1177/10468781211006758

Wenzler, I., & Chartier, D. (1999). Why do we bother with games and simulations: An organizational learning perspective? *Simulation & Gaming, 30*(3), 375–384.

Wijse, de-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332. https://doi.org/10.1177/10468781211015707

Yang, M. M., Zhang, Y. C., & Yang, F. F. (2018). How a reflection intervention improves the effect of learning goals on performance outcomes in a complex decision-making task? *Journal of Business and Psychology, 33*(5), 579–593. https://doi.org/10.1007/s10869-017

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Debriefing: A Practical Guide

6

David Crookall

Dedication
This chapter is dedicated to a dear friend, the late Dr. Ajarn Songsri Soranastaporn. Ajarn Songsri was the initiator (with me) and Secretary General of ThaiSim, the Thailand Simulation and Gaming Association. For over 10 years, she and her colleagues organized the International ThaiSim Conferences (including an ISAGA conference), probably the most wonderful and memorable simulation/gaming meetings anywhere in the world. She helped with the journal *S&G*, was a major force in Thailand for educational simulation and applied linguistics and was dearly loved by all her colleagues and students. In true Buddhist tradition, she gave so much and asked for so little. We might feel closer to Ajarn Songsri and understand her passing better by reading Upasen and Thanasilp (2020).

Simulation without including adequate debriefing is ineffective and even unethical. (Willy Kriz, 2008)

The debriefing is where the 'magic' happens. (Dick Duke, 2011)

Overview

Debriefing is the most important part of a simulation. That is why this is a key chapter in this book. The chapter contains several sections, each one offering insights, guidance and stories for debriefers. The central sections of this chapter look at various aspects of debriefing, such as what it is and when, why and how we should conduct it. Each section looks at debriefing, not so much from a theoretical stance, but more from a practical, down-to-earth perspective. The appendix contains a number of ready-to-use examples of materials to use for

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debriefing and also suggestions of courses or curriculums that use larger simulation and thus that must employ and deploy debriefing in a judiciously managed fashion. Having developed and conducted debriefs and trained trainers in debriefing for many years, I have written this chapter from a personal angle, sometimes offering short vignettes or stories of my own experience.

Keywords

Simulation · Experiential learning · Debriefing · Reflection · Sharing

Learning Objectives

By the end of this chapter, readers should be able to:

- grasp the broad **notion** of debriefing, and its importance in the simulation endeavour;
- understand (a) that **simulation objective**s are different from **learning goals**, (b) that simulation is about **experience** and (c) that debriefing is about **learning** from that experience;
- understand the **complex** nature of debriefing—its design and implementation;
- understand that debriefing can **vary** widely in its format, its structure and its modus operandi;
- **configure** debriefing sequences and integrate them into a simulation, **during** and/or **after** the simulation;
- **adapt** debriefing forms (such as those in the Appendix) for their own games and learning objectives:
- **design** debriefing materials for their own specific learning objectives;
- think about debriefing as **belonging to participants** and realize that facilitators need to get out of the way of their learners' learning;
- be (more) **flexible** in their debriefing facilitation and be willing to **change** strategy as the simulation or debriefing evolves;
- understand clearly that the **learning starts when the game stops**;
- understand some of the many **aspects** of how to run a debriefing;
- be more **confident** as a debriefer.

This chapter cannot, however, teach you the hands-on skills of facilitating debriefing. The only way that you will learn to facilitate a debrief is to do it yourself, make mistakes, get feedback, reflect and implement corrections—in cyclical fashion, somewhat as in the experiential learning cycle itself.

Preamble

Meaning. Debriefing can be described as an episode during a simulation in which participants reflect on and share their experience with fellow participants, with the

purpose of transforming it into learning. That is one way of describing the essence of debriefing. Many other descriptions of the term and action of debriefing have been offered by practitioners and theorists. This chapter does not attempt to review the many definitions of and publications on debriefing. Readers who wish to pursue a more academic route to working with or understanding debriefing should look at some of the references at the end of this chapter.

Practice. The only sure and convincing way to understand and learn debriefing is to practice it (as a facilitator–debriefer) or experience it (as a participant). In the same way that a book cannot substitute for the experience of a simulation, a chapter cannot make anyone a master debriefer—only practice, training, debriefing (of your debriefing) and more practice can do that. You cannot learn to ride a bicycle from a book or lecture; you have to get on and fall off several times, and then continue to practice. Recently, tools have been developed to help improve debriefing skills (see, e.g., Coggins et al., 2022).

Guidance. This chapter, then, can only provide guidance; it is you, dear reader, who must practice and learn. This chapter will provide ideas, leads, food for thought and concrete, ready-to-use examples of materials for debriefing; you have to go out, jump in, get debriefed on your debriefing, adapt ideas here in this chapter, consider other practitioner's ideas and be sensitive to your participants' feedback. Every practitioner follows their own path; my path has been long and winding, and I am unlikely ever to reach the end. Luckily, I have had friends, colleagues and debrief participants to suggest, guide and criticize along the way. I hope that this chapter will be a useful companion for you.

Event. As you read through the chapter, you will encounter a variety of terms for the kinds of things that are, and often must be, debriefed; they include simulation, game, exercise, experience, role-play and event. I like the term ***event***. Many years ago, my friend and talented game designer, Ken Jones (1998), used the term *event* to refer to a game or simulation and other similar types of …, well, event. At first, I felt uneasy with the term, but over recent years I found myself being drawn "back?" to the term. Ken used the word in the title of one of his books: *Interactive Learning Events*. One great advantage of this term is that it avoids the tendency for some to write nonsense like "a simulation is a game that …" or "a game is a simulation in which …".

In addition, we all know (or at least should know) that we tend to vary the use of our terms as a function of the character of our interlocutor, not the characteristics of the event itself (the social psychology of language also tells us that, see Giles, n.d.). For example, with an audience sceptical about games, I use the word simulation or activity (even though I know that they are, technically, different things). To distinguish debriefing from event, I will use the term *episode*, for example, a debriefing or reflecting or taking stock episode during a simulation event. You will also notice that I sometimes use the terms game and simulation interchangeably, in similar vein to the early gamers, who used the term game as shorthand for

simulation/game. Many books and articles offer their varied definitions of the terms used. My own attempt, which needs some major revision at some point, is to be found in one of my early articles (Crookall et al., 1987).

Rules. One thing that you should keep in mind is avoiding dogma of any kind, either in what some people say or even in your own thinking—and that includes my own dogma in this chapter! Learning and people are so complex and varied that it is impossible, in our current state of unknowledge, to lay down the "law of debriefing", except maybe to say that it really is a **required** episode in almost all experiential learning activities, including games and simulations. In other words, the first, but crucial, rule about debriefing is that it must be done. The second rule is that you must do it well, both for your own professional satisfaction and for the well-being and learning of your participants.

A third rule might be: Use your own ideas; take advice, but adapt to your participants and their learning; experiment with a variety of formats, configurations and materials; invite your debrief participants to help by asking them about the debrief; conduct action research on your debriefings; never mind what others (especially fellow teachers) might mutter, do your thing; be proud (in yourself or even brag if that is your personality) when you feel that a debrief has gone particularly well, but remember that the people doing and making the big effort in the debrief are your participants, you are a facilitator.

The rest of this chapter provides some down-to-earth thoughts on the debriefing episode from several angles. The chapter is organized according to several wh-words, starting with ***What*** and ending with ***How***.

6.1 What—Object/Idea/Process

Many authors start their text with a definition. Just as with the all-too-many and confusing definitions of terms like *game* and *simulation*, the word *debriefing* has been defined in a myriad ways, and each time in a manner that gives the impression that its author considers it to be definitive, and that no more thought or discussion is possible.

The important thing is to do debriefing well, not to worry about how it may be variously defined. For the purpose of this chapter, in a book on simulation, the simple description offered at the start will suffice:

> Debriefing can be described as an episode during a simulation and in which participants reflect on and share their experience with fellow participants, with the purpose of transforming it into learning.

That description (not a definition) has the advantage of saying what it is (an episode or activity in a simulation or similar learning event), who does it (participants), the manner of their participation (refection and sharing), the object of their reflection

(their experience), why they do it (to learn) and how it happens (through transformation). Debriefing occurs widely outside simulation, and this will be mentioned as it is relevant for our learning-focused debriefing, but for present purposes, our main concern is its use in simulation/games for learning.

Some readers may twitch at seeing the preposition *during* in the phrase "episode **during** a simulation". My approach is that debriefing should form an integral part of a simulation, starting with design. Debriefing should also be mentioned in the introduction (briefing) for a simulation. It is usually a mistake to design a simulation, and then as an after-thought to say "oh, well, maybe we should add on something for a debriefing". That approach is likely to take you into territory so well highlighted by my friend Willy Kriz (2008) in his statement that "simulation without including adequate debriefing is ineffective and even unethical". In addition, thinking of debriefing as being *included in*, as an integral part of, a simulation makes it easier to think about including debriefs at strategic points during the simulation, and not exclusively placed at the end; this is discussed in the section *When*.

Different people and professions use different terms for essentially the same thing. Table 6.1 lists some that I have seen or heard; no doubt others exist.

Of course, just like game and simulation, the terms related to debriefing have a variety of meanings, each one conceptualized for a given purpose, and, thus, resulting in a variety of designations. For example, the US Army uses *after action review*, but the UK Army uses the term *debrief*. This chapter uses a single term to embrace the existing variety. The term *critical incident stress debriefing* (CISD) is used in specific circumstances after a disaster such as an earthquake or an accident. It usually needs special training. It will not be discussed in this chapter, although it may be that some elements here could be useful in CISD, and some aspects of CISD can be useful in debriefing for learning.

Table 6.1 A variety of terms used for debriefing

• After action review (AAR)*	• Feedback
• After-game discussion	• Game critique
• Assessment	• Gather intelligence
• Cognitive assimilation of experience	• Guided reflection
• Critical incident stress debriefing (CISD)	• Historical group debriefing
	• Interactive, bidirectional and reflective discussion
• Critical analysis	• Pause and learn
• Critical appraisal	• Post-experience analytic process
• Critical reflection	• Post-game analysis
• Debriefing	• Process debriefing
• Deliberate reflection on experience	• Processing experience
• Exit interview	• Psychological debriefing
• Facilitated reflective conversation	• Reflection
• Facilitator-guided post-event debriefing	• Transforming experience

* "A professional discussion of an event, focused on performance standards, that enables soldiers to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses." (US Army)

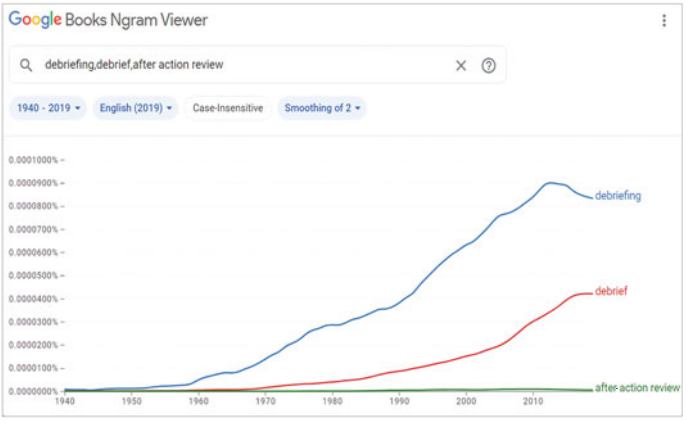


Fig. 6.1 Evolution of the use of the terms debrief, debriefing and AAR from 1940 to 2019 (blue "debriefing", red "debrief", green "after action review")

Debriefing is more widespread, more commonly used and more talked and written about now than when I started to use it—in the late 1970s. This is reflected in the increasing usage over time, depicted in Fig. 6.1.

The origins of the word *debrief* go back a long way, as hinted at in Fig. 6.1. Etymonline offers these origins (edited):

> **Debrief** (v) "obtain information (from someone) at the end of a mission" 1945 (implied in verbal noun de-briefing), from de-+brief (v).
>
> **De** Latin adverb and preposition of separation in space, meaning "down from, off, away from", and figuratively "concerning, by reason of, according to".
>
> **Brief** (v) "to give instructions or information to", 1866; originally "to instruct by a brief" (1862), from
>
> **Brief** (n) early 14c., *bref*, "a writing issued by authority" from Latin *breve*, noun derivative of adjective *brevis* "short, little", which came to mean "letter, summary" and thus came to mean "letter of authority", which yielded the modern, legal sense of "systematic summary of the facts of a case" (1630s). Sense of "a short or concise writing" is from 1560s.

6.2 Whether or Not

However, despite the increasing use of the term in publication, we should not cry victory too soon for the use of the method in action. I have unfortunately come across far too many instances and examples where debriefing was not used when it should have been. In a chapter on debriefing, it is worth mentioning a few of these omissions, keeping in mind Willy Kriz's ethical imperative. I still find myself

in situations where debriefing is ignored, unheard of or even frowned upon. See examples in Box 1.

During my term as editor of *Simulation & Gaming* (Sage), I wrote into the author guide an extensive section on debriefing. It included this instruction:

> Articles that deal with issues, events or topics in which debriefing plays or should play a role **must** discuss this aspect fully.

Even with this in the author guide, I received manuscripts that made no mention of debriefing when it was clear that this should have at least been mentioned. In one instance, the author asked me what it was. After explaining it, with a few references, the author said that they would have to redo their work to include debriefing. A few months later, I received the revised manuscript, which now included debriefing, and this had actually changed their results. The author conveyed their satisfaction with the changes that they had made, both in their practice and in their article. Even now, I come across articles or books about games or simulations and find myself muttering to myself: Why on earth did they not discuss, let alone mention, debriefing? A key test to know whether I should spend time reading an article or book on simulation/gaming (for learning) is whether it contains some mention of debriefing. If it does not, then I tend to discard the publication.

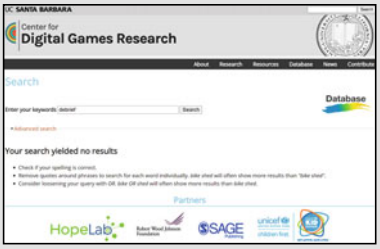
The assumption in the above-mentioned author guide was that debriefing must be the **default**. You only leave out debriefing if you have a compelling reason to omit it. You can dispense with debriefing only if you are absolutely sure that no ethical issues may be raised as a result, or if the simulation/game itself is used as a debriefing method.

Box 1. Two examples of inexistent debriefing

Some years ago, I was asked to speak at a newly-formed, innovative conference series called SEGAMED (Serious Games in Medicine and Healthcare), founded by my friend Pascal Staccini of the Université Côte d'Azur. For my presentation, I gave an overview of debriefing and emphasized its importance. For that, I looked at medical organizations doing simulation.

During my research for the talk, and to my amazement, I discovered that only some were doing this. Most medical simulation centres (such as those attached to training hospitals) emphasized and conducted debriefing. However, other organizations, mostly medical game companies, made no mention at all of debriefing. During the early conferences, I asked game company representatives at their stands what kind of debriefing they had built into their game designs. Some said that it was not needed; some had not even heard of it—I kid you not. During my online searches, I even came across a searchable database portal for health games. The image here (with the happy looking man) shows "no results" for a search on the term *debrief*.

While writing this chapter, I searched for that website, but it does not seem to exist anymore. However, I found another searchable games website, called "Digital Games Research". The search term *debrief* returned "no results", despite seeming to be sponsored by Sage, publisher of the world's top simulation journal, and in which several articles on debriefing have appeared.



Most entertainment games are not explicitly debriefed, although people may talk informally about their event for some while, even weeks, after. If you play *Rummy* with your family, it is unlikely to be the object of heated debate, rather it is likely to be forgotten fairly fast. If you are an avid *Chess* player, then you could spend hours and days going back over and analysing your moves.

Some games can be used as a debriefing method. My friend, Thiagi (Thiagarajan, 1992), wrote a delightful article that contained instructions for running a variety of what he calls D-Games. I have used some with great success. Indeed, I have used some to debrief, not just a game, but a whole several-day event, such as a conference. It is important to weigh carefully the pros and cons of using a fun-game activity to debrief an event. If a mismatch occurs between the event (emotional, heavy) and its D-Game (light-hearted), it could have the opposite effect of what you and the participants expect.

An example of another type of event that *might* not need debriefing is Companion Modelling (or ComMod, e.g., Étienne, 2014). Some ComMod events, even though they involve role-play as part of their procedure, could be conceptualized, not so much as large-scale simulations needing a debrief, but rather as large-scale debriefs of a real situation, such as conflict between two communities over natural resources. This is not such a wild idea if you remember Thiagi's D-games. Much will depend on the configuration and context of the ComMod event.

What debriefing is, discussed above, and the simple fact that it is being used more widely than ever take us to the next topic of *Why*.

6.3 Why—Reason, Purpose

This section looks at the broad reasons for, purposes behind or uses of debriefing. They include learning, peace and conflict, assessing problems, processing experience, reducing stress, for ethical reasons, as part of research and several more. The overarching purpose for debriefing for most readers of this chapter will be to help people learn from their experience in an event. The learning process usually involves some degree of stress—after all, little learning takes place if no effort is expended and no optimal stress is experienced.

Before reviewing the main *Whys* of debriefing, it is worth looking at some of the wrong assumptions that are too often expressed about simulations or games. If we have erroneous ideas, or entertain myths, about simulation, then we are unlikely to be able to get our debriefing right.

6.3.1 Myths

Unfortunately, in recent years, some unhelpful myths about learning and games seem to have spread unchecked. Some lay and even some professional game users appear to assume that a game automatically results in people learning, despite little or nothing being specified about that learning, such as its goals or processes. You may encounter people with little experience in using learning games or people who have recently discovered games in education or heard of what are called "serious" games. Such people may have become blindly enamoured of them, and made an enthusiastic, snap judgement about how "powerful" they are and even that they can teach anyone anything. That would qualify as a crush on games. One example, among many, is a fairly large website that touts that

> Games for Change … empowers game creators and social innovators to drive real-world impact through games and immersive media. (https://www.gamesforchange.org)

This is a worthy mission, but I could not find the word *debrief* on any of its pages. I did find it twice, mentioned in passing, with no discussion, in a downloadable 45-page pdf file (titled *XR for social impact*). Another anonymous and undated, 52-page pdf file, entitled *Games pack: Games and learning*, downloadable from that website, tells us about the magic power of games, in these terms:

> Games drop students into accessible, inquiry-based, complex problem spaces that are levelled to deliver just-in-time learning and that use data to help student players understand how they are doing, what they need to work on, and where they need to go next.

and yet, the word debrief is not mentioned once. The idea of "dropping students into spaces" is, I would think, hardly conducive to learning! Also, the concept of "just-in-time learning" is not made clear and is certainly not an automatic outcome of games. It very much depends on how the game is designed, and especially on how it is debriefed. I wonder also how a space can be "levelled" and how learning can be "delivered"—learning is not like a pizza. Another, again anonymous, 42-page pdf file, entitled *How to teach with games*, makes no mention of debriefing. All professionals of simulation must be wary of this kind of commercialese, where buzz words from other areas, such as advertising and marketing, take precedence over real content, or even attempt to cover up empty claims. As simulation/gamers tend to be inventive, it is relatively easy for them to over promise and under deliver. This can be dubbed learnwashing.

A book that caused a buzz at the time was *Reality is broken: Why games make us better and how they can change the world*. In over 300 pages, it contains not one mention of or reference to debriefing (ascertained by a search through the pdf, not

by reading). The book appears to make the erroneous, and possibly dangerous, assumption that games equal learning. This extract from a review of the book captures the gist nicely.

> Engaging with the argument that gamers are our future feels a bit like a game itself. … Such are the extremes of opinion in my mind that I am awed by the idealism while also believing that *Reality is Broken* could be an hour-long comedy show at the Edinburgh Fringe Festival. The latter view is fuelled by games such as McGonigal's own Cruel 2 B Kind, which uses mobiles and social networking to reward random acts of kindness with points – behaviour that is supposed to spill over outside the game's boundaries. Other shiny, happy examples also provoke snorts of derisory laughter, but the underlying message is clear: gaming is good and gamers are benevolent. (Hall, 2011)

All one needs to do is to throw a bunch of people into a game, or throw a game at a bunch of people, and out of the hat pops learning. It seems that fashion, with unbridled overenthusiasm, not learning, takes the upper hand for some teachers and trainers in using educational games, and at the same time may even drive curriculum choices and the running of classroom activities. These myths and leaps of fantasy deter us from unlocking the real learning that can be achieved from properly-debriefed simulation. Some of these myths are outlined in Table 6.2.

Table 6.2 Myths about events and learning; wrong, unfounded or dangerous assumptions

Myth	Notes
People learn from games.	No. People learn from processing their game experience. Significant learning from a simulation/game happens in the processing and transformation of the game experience, not in the game itself. A crucial element of that experience is engagement (see the work done on this by Whitton, 2011). All our efforts to produce snazzy games will succeed (in helping people learn) only if we incorporate appropriate debriefing. People learn from processing and transforming (thinking about, sharing, structuring, conceptualizing, …) their experience, which means we need to debrief.
Having fun in a game produces learning.	No. People learn from processing and transforming their participation in a game experience. The often-observed giggle-type laughter during a game can be deceptive. It is often assumed and superficially appears that it indicates having fun. However, that is illusionary. Such laughter and other awkward behaviours stem from a variety of negative feelings, including feeling uncomfortable, surprise at unexpected actions, embarrassment, reluctance to participate (e.g., Pulsford, 1993; Saunders, 1985), etc. All those types of feelings may, in some ways, be considered as natural (having counterparts in the real world), but they are nevertheless present and can interfere with any learning that is to come out of the game. They do not usually constitute fun and they thus need to be addressed in the debriefing.
Video (serious) games automatically result in learning.	This was a belief among people working with video games for learning, often dubbed "serious games" (usually erroneously), in large part due to the bad name that video games have, and the self-consciousness of teachers and trainers in using the term *game* in a context (e.g., school) where they fear that their peers or even their students will not take them seriously. They feel some kind of need to signal apologetically that they are after all serious people and doing non-frivolous things in class. Usually, such ambivalence

(continued)

Table 6.2 (continued)

Myth	Notes
	and equivocation indirectly undermine their own effort and standing, and it does a disservice to the field of simulation/gaming. A basic contradiction emerges here. If games are fun (and therefore result in learning) why would we wish to make them serious? If our games are serious, how can we have fun and so, one assumes, help people learn? We cannot have it both ways.
All we need to do is throw a bunch of people together into a game and they will learn.	Even though we have a fairly good idea of how to design and build simulation/games, we still seem, as yet, to have only hazy theories of how people learn from them. As debriefing must be an integral part of a simulation, from the design stage on. I say "fairly good" because it is (I think) still early days in the development of excellent debriefing. It may well be that participants dumped into a game (even with bad facilitation and no debriefing) do learn, but they are likely to learn the wrong thing or even worse to learn that games are useless for learning, even though they appear to be fun. Once we have fully embraced the idea that debriefing is an integral part simulation, then we may be in a better position to conduct research to understand the overall learning process (event + debriefing as an integrated whole).
"Serious games" need no debriefing.	So-called "serious games" with no or inappropriate debriefing could actually be harmful to learners. The serious games industry is unlikely to make serious progress unless it does some serious debriefing.

It is rather ironic that some teachers use the term *serious game* and in the next breath assert that it is the fun that guarantees learning. My impression is that once people latch on to the superficially beguiling term, it becomes a language habit, and used without much thought about the implications. Once one pronounces such a term, it tends to lock the speaker into a social commitment, and switching back to another term can give the feeling of losing face with one's peers. My impression also is that those who use the term tend to do less or no debriefing. They are also probably less likely to read a chapter such as this.

The term *serious game* is a misnomer and is riddled with problems and impossible paradoxes. A preferred term is *learning game* or *educational game*—or simply *game*, in the way that we have been using it conveniently and widely, for decades, among gamers as an informal short-hand term for simulation/game/role-play/etc. (See, however, an interesting discussion by Djaouti et al., 2011).

6.3.2 Socio-cultural Context

Myths arise in a context, and this is no less true for simulation/games and debriefing. Thus, the context in which a simulation/game and debriefing are conducted is of vital importance. A useful summary of learning context is provided by an admired colleague, Alan Maley (2015). He outlines the following contextual dimensions of learning:

- Physical, material and economic;
- Socio-political and religious;
- Linguistic;
- Philosophical and educational;
- Family and peer group;
- Psychological, relational and affective.

Context becomes a major factor, for example, in

> cases where certain sections of the population are given privileged access to education to the detriment of other sections, as, for example in Malaysia or India. Or the system may take a non-scientific stance towards science, as in the Creationist approach in the US, or view science as a fixed body of expertise to be used for political objectives rather than as an open-ended practice of inquiry. They clearly affect the way geography or history is taught. Even the Mercator projection, which forms the basis for many maps, has a lot to answer for. Politics can affect language learning too, as in cases of post-colonial resistance to the language of the colonisers, or in views of one's own language as being inherently superior to the one being learned. Factors such as these are more influential and more stubborn than even material factors, partly because those who hold such views are often unaware that they do so. (Maley, 2015)

It is obvious that some types of context will be more conducive to participatory methods, exchange and debriefing than others. For example, gender attitudes and beliefs will influence game and debriefing outcomes; a game on gender relations with gender-prejudiced participants may make for difficult debriefing, but may also result in greater learning and behaviour change. The design of the debriefing for a group with gender prejudice may have to be more elaborate and take more time than for participants who are already attuned to gender issues.

The outcomes of debriefing for a game like STAPOWER with disadvantaged participants are likely to differ from a session with upper-class, British "public school" boys or in a school with upper-cast Indian pupils. Indeed, it is unlikely that such a simulation is even run in elitist establishments, riddled as they are by prejudices of and hunger for grandeur and power. In either case, the debriefing will need to be carefully crafted and facilitated taking into account the type of participant.

In some cases, simulation/games can be a way of breaking into taboo topics and generating useful exchange. For example, some cultures do not allow the discussion of cross-cultural issues in schools. One colleague, who influenced me greatly, Paul Pedersen (1995), was able to get his S-E-Asia class to discuss taboo (even banned) issues by "enclosing" them in a simulation. Apparently, the authorities allowed this because a simulation was, for them, just a fiction, and not the real thing. Of course, in such a context, difficulties might arise in a debriefing that encourages participants to draw parallels between the game and the reality, to examine how the game departs from and reflects one's ideas and experience of reality. (Unfortunately, Paul did not tell me how he handled this.)

Participant and institutional beliefs about learning may have a major impact on how we run and debrief games, indeed on whether or not we run games at all. It

should be fairly easy to guess which of the following two context types is more conducive to learning from events and debriefing.

> Other factors include the overall beliefs about how learning should be conducted. Broadly conservative or traditional beliefs place a high value on discipline, effort, competition, memorisation and testing, and tend to view learning as something difficult and painful. By contrast, more liberal or exploratory approaches view learning as a pleasurable, creative and cooperative enterprise where the emphasis is on the quality of the process rather than the short-term product in the form of examination results. (Maley, 2015)

Sometimes you need to muster up a certain amount of courage to impose your way of "teaching". On exiting my classroom, at the end of one of my classes, in which students participated in a simulation, I encountered a colleague teacher exiting his classroom. He complained, "your class makes a lot of noise", to which I retorted, "yes, but that indicates that my students are working hard and learning". I did not hear from him again.

The type of context will also determine, not just the amount, but more importantly, the type of talk and dialogue that takes place there. This is important for both learning and for simulation and debriefing. The most effective learning (probably) occurs through talk and dialogue (see, e.g., Alexander, 2018b). Both simulation and debriefing involve and depend on exchange and sharing through talk and dialogue. Some insightful ethnomethodological studies regarding talk in simulation are worth looking at: Francis (1989), Sharrock and Watson (1985), Sjöblom (2006) and others. It would be even more insightful to have conversational analysis conducted on debriefing. This takes us to the next topic of approaches.

6.3.3 Approaches (Educational Philosophies and Theories of Learning)

One might argue that educational philosophies and theories of learning are part of the context of education; they provide the backdrop to, and influence, the way we facilitate simulation and debriefing. Through a process of social construction and legitimization (see Berger & Luckmann, 1966), these philosophies and theories arise out of, and develop (thrive or whither) within, socio-politico-cultural educational fashions. Indeed, education itself can be considered as a social construction (see Dragonas et al., 2015), and thus so can the area of simulation/gaming and the practice of debriefing. Those two works should be high on the reading list of any serious debriefer.

A chapter on debriefing would not be complete if it did not mention theories of learning, especially in relation to the various ways of debriefing. Unfortunately (or fortunately ☺), you are reading a less than complete chapter, but you will find many books and articles elsewhere that outline, discuss and analyse the various facets, ins and outs of many learning theories that have been concocted over the years.

However, learning simulation users often refer to one theory in particular. This is experiential learning theory (ELT), developed principally by my friends Alice and Dave Kolb (Kolb, 2015; Kolb & Kolb, 2009; Thatcher, 1990). Over the last few years, with the increase in use of participatory and experiential methods in education and training, ELT has gathered a large following—and rightly so. Their books and articles have inspired many people using participatory methods—see the references in the bibliography.

The principal concern in this chapter is the use of debriefing in simulation to help people learn. One thing that will help participants learn (more effectively) is if they, in addition you, have an idea, even if rather hazy, about the theoretical underpinnings of the rather complex journey that you are asking them to follow. The one that I tend to use is ELT, as it is probably more immediately understandable by participants. It is helpful for participants to understand the process and the relationship between simulation+debriefing and their learning, even if only superficially. For first-time participants, I often use the diagram in Fig. 6.2, starting with concrete experience, furnished by a game.

Other related theories are also relevant for simulation and debriefing, for example, engagement, motivation, adult learning, constructivism, dialogic learning, cognitive learning and social learning. Also, fortunately, you do not need to know a huge lot about these theoretical edifices in order to design and conduct good debriefing. For the sake of simplicity, we may group philosophies and theories under the unassuming, umbrella term *approaches*. They have been developed over the last half century or more, and go under a variety of names, often associated with a person, usually the person who did the pioneering work. They often overlap and reinforce each other. Each approach often includes ideas drawn from other approaches. Of course, you do not need to read all of these to be able to do good

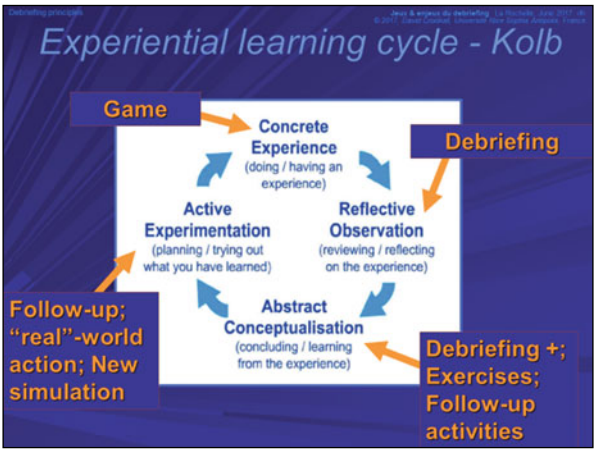


Fig. 6.2 Explaining debriefing to participant learners, using ELT

debriefing, but a familiarity with some of the areas and approaches is likely to provide intellectual and emotional support as you search for and develop your own ways of debriefing. Most of the approaches would confidently support the activity of debriefing in general and some of the approaches would strongly support your own ways in particular. If pushed, I would say that the five that I have found particularly helpful have been experiential learning, reflection, self-determination constructivism and engagement. Some are listed in Table 6.3, with a few references.

Of course, other terms have also been used, sometimes with the word *learning*, such as deep, active, project-based, problem-based, brain-based, situated, mastery learning and so on. You will find more about these and similar approaches in a wide variety of publications (e.g., Angelini, 2022; Clapper, 2010, 2015; Kriz, 2008; Phillips, 2014; Whitton, 2011; Whitton & Moseley, 2014)—all relevant to simulation and debriefing.

Cornerstones of the above approaches are often mentioned in writing on simulation/gaming and debriefing. They include the ideas that:

- Experience and making sense of it are at the heart of all meaningful learning.
- Interaction, participation and engagement lead to rich learning experiences.
- Learning is achieved through creating communities, generating meanings and developing understanding.
- Talk, discussion and conversation are the prime means by which humans achieve learning.
- "Understanding is fostered through discussions and collaboration." Jerome Bruner.
- "Talk is the foundation stone of all learning." Debra Myhill.
- "It is hard to imagine an effective approach to learning that does not involve the learner in some kind of experience." (Phillips, 2014).

Of course, each of the above approaches will emphasize certain aspects of learning, and thus influence simulation and its debriefing in certain ways, sometimes subtle, sometimes overtly and strongly. This chapter is not the place to analyse each approach in terms of its influence on simulation and debriefing. However, some familiarity with some of the approaches can bring greater confidence in your journey of learning to guide debriefing and make it more effective than without some background in some of the approaches.

> This means a shift from education as knowledge absorption to knowledge making. It is not what you can recite that reveals a good education, but what you can do. … what we take to be known is always in motion. The challenge for future educational practices is preparing students for a life of continuous innovation—or knowledge making. … when relational process is placed in the forefront of concern, a major shift occurs. One begins to ask how pedagogical practices can become more participatory and collaborative; and to explore alternatives to the evaluation of individuals. … The emphasis on participatory processes extends as well to teacher training, and indeed to thinking about the well-being of entire educational systems, and the way they function to build meaning and inspire action. (Dragonas et al., 2015).

Table 6.3 Approaches to learning

Approach	Originator
Andragogy	Alexander Knapp, Malcolm Knowles. See Clapper (2010)
Cognitive learning and educational goals	Bloom et al. (1956)
Community of practice; social learning	Wenger (2008), Lave and Wenger (1991), García-Carbonell et al. (2004)
Conscientization; critical pedagogy; praxis; democracy; rights	Freire et al. (2020), Freire and Freire (2021). Noam Chomsky (Chomsky & Macedo, 2000; Chomsky & Otero, 2003)
Constructivism (cognitive, social, …); zone of proximal development; scaffolding	Jean Piaget; Dewey (1916, 1938); Bruner (1977); Berger & Luckmann (1966); Lev Vygotsy; Maria Montessori. See Clapper (2014), Kriz (2008), Dragonas et al. (2015)
Cooperative, collaborative and out-of-class learning	Johnson and Johnson (1987), Jacobs and Crookes (2022), Jacobs and Kimura (2013). See Clapper (2015)
Dialogic learning	Alexander (2018a, 2018b, 2020), Freire et al. (2020), Freire and Freire (2021), Flecha (2000), Skidmore and Murakami (2016), Mercer et al. (2019), Wegerif (2022)
Emotional intelligence	Goleman (1998)
Engagement	Whitton (2011), Christenson et al. (2012)
Experiential learning	Dewey (1916, 1938), Kolb (2015), Kurt Lewin
Flow	Csikszentmihalyi (2014, 2016)
Humanism	Carl Rogers; Abraham Maslow
Language	Duke (1974), García-Carbonell et al. (2014), Crookall and Oxford (1990)
Metacognition	Flavell (1976, 1979)
Multiple intelligences	Gardner (2011)
Narrative movement	Phillion et al. (2005), Rossiter and Clark (2007), Clark and Rossiter (2008)
Reflective learning; Tacit knowledge	Schön (1983, 1990)
Self-directed learning; self-determination	Holec (1981a, 1981b, 1988), Hiemstra and Brockett (2020)
Situated learning; communities of practice	Lave and Wenger (1991)
Social learning; self-efficacy; social interaction	Bandura (1977, 1995, 2012)
Sociocultural learning; spiral curriculum	Bruner (1977)
Styles, strategies	Honey and Mumford (1986), Myers (2014), Alice and David Kolb (2013), Dunn and Dunn (1978), Oxford (1990)
Transformative learning; critical reflection; emotion	Mezirow (1991)
Overviews	Some overviews of some of the above: Illeris (2018), Malinen (2000), Johnson (2022), Pritchard (2018)

Simulation practitioners claim that participatory simulation is a powerful tool to achieve such things, but their real or true power resides in the debriefing. Many participatory activities, such as outings, projects, outdoor activities, school holiday camps (Colonies de Vacances), internships and expeditions, could be enhanced greatly if they employed debriefing, especially in a form adapted to the activity and participants. In addition,

> There is no way to help a learner to be disciplined, active and thoroughly engaged unless he perceives a problem to be a problem or whatever is to be learned as worth learning, and unless he plays an active role in determining the process of solution. That is the plain unvarnished truth, and if it sounds like warmed-over 'progressive education', it is none the less true for it. . . .
>
> We have largely trapped ourselves in our schools into expending almost all of our energies and resources in the direction of preserving patterns and procedures that make no sense *even in their own terms*. They simply do not produce the results that are claimed as their justification in the first place—quite the contrary.
>
> Although the word 'game' has connotations that are not usually associated with intellectual growth, there are few concepts or skills that could not be learned with a rare degree of understanding and durability through an educational game approach. In fact, a 'game approach' [and debriefing] permits the development of a learning environment that is much more congruent to what we know about learning than any other approach now used in schools (Postman & Weingartner, 1969; emphasis in the original).

6.3.4 'Truths'

In the light of the debriefing myths and the variety of contexts and of approaches discussed above, it is useful to remind ourselves of some basic "truths" (some would say assumptions) about learning, especially in regard to games and debriefing.

- Learning is a journey.
- Learning goals are totally different from game objectives.
- Game objectives end when the game ends.
- Game experience is processed and transformed in the debriefing (and beyond).
- Learning goals are achieved mostly in (and after) the debriefing.
- Learning arises from, and is enhanced by, the processing and transformation of game experience.
- Skills are learnt on task (reflection in) and from discussion about task (reflection on).
- Disciplines are artificial constructs invented by academics; simulation/games are multi-disciplinary.
- Both the real world and simulation are interdisciplinary, multi-skilled.

Some further Assumptions Underlying Experiential Exercises (Schwartz, 2002) are also worth keeping in mind when designing your debriefing:

- Learning is more effective when it is an active rather than a passive process.
- Problem-centred learning is more enduring than theory-based learning.

- Two-way communication produces better learning than one-way communication.
- Participants learn more when they share control over and responsibility for the learning process than when the responsibility lies solely with the group leader.
- Learning is most effective when thought and action are integrated.

6.3.5 Ethics

When people have been asked to participate in an event that involves them personally (cognitively, emotionally, socially, etc.), it becomes an ethical responsibility to provide a safe space and moment for the participant to process their experience in such a way that they may learn from it, be enriched and move on in life. Some events can be fairly stressful, and that stress is best channelled in a positive manner, allowing participants to understand their experience in such events, rather than having to deal later with cloudy after-thoughts or lingering prejudices.

Increasingly, people are forced to participate in a stressful or traumatic event, either inadvertently, such as in a personal attack (theft, terrorism) or a natural disaster (earthquake), or unwillingly, such as in politics, war or self-defence (e.g., defending one's land rights). The greater the stress and trauma, the greater the ethical imperative to enable participants or victims to recover or start their recovery, and the more elaborate the debriefing needs to be. A traumatic experience is often debriefed in critical incident stress debriefing (CISD, see below).

In the comparatively benign events used for educational purposes, participants may still experience stress and upset. This may be by design or unplanned. The stress or upset may be designed into the simulation (e.g., a simulation of a doctor telling bad news to a family or of a confusing intercultural encounter) and made part of the learning objectives, or the stress may arise from some unexpected incident or unforeseen parameter (see Boxes 5 and 7). Facilitators are under an ethical obligation to attend to such emotions (see Pearson & Smith, 1985). In addition, it is certainly unethical to use games or debriefing to peddle misinformation, erroneous ideas or untruths.

In addition, it is a professional responsibility and ethical obligation for all those involved in learning and training games, as designers or facilitators, to get trained (or self-train) in designing and facilitating debriefing sessions as part of the events that they run. Also, as Kriz (2008) implies, just as designing a game without including debriefing in the design process and including debriefing materials in the game is unethical, undertaking to debrief a game without basic debriefing skill training is unethical. This is so important that several gamers in the medical arena have designed debriefer training and standards and make it a requirement for anyone to debrief in a clinical setting—see, for example, the eminently clear standards for debriefing set out by the INACSL Standards Committee (2016). In addition, for debriefer coaching, see Cheng et al. (2017), for a debriefer assessment

instrument, see Brett-Fleegler et al. (2012), for debriefer stance and interpersonal skill, see Rudolph et al. (2007), and for best practices, see Lyons et al. (2015).

Many professional associations have codes of ethics and ethics committees and produce ethics reports. Examples of such organizations are the American Geophysical Union (AGU), the European Geosciences Union (EGU), the British Educational Research Association (BERA), the Ecological Society of America (ESA), the Association for Computing Machinery (ACM), the American Psychological Association (APA) and many others. In 2010, the 2nd World Conference on Research Integrity developed the Singapore Statement on Research Integrity. It has been adopted by several organizations, such as the American Educational Research Association, which itself has a 12-page code of ethics. Another is the Association for Practical and Professional Ethics (APPE),

> dedicated to advancing scholarship, education, and practice in practical and professional ethics. APPE fosters moral reasoning skill development, works to promote ethical conduct in all sectors of our daily lives, (*About APPE*, n.d.)

One vibrant organization, the International Association for Promoting Geoethics (IAPG), is extremely active in widening the debate on problems of Ethics applied to Geosciences. In 2016, it adopted the Cape Town Statement on Geoethics, and it has been translated into more than 35 languages.

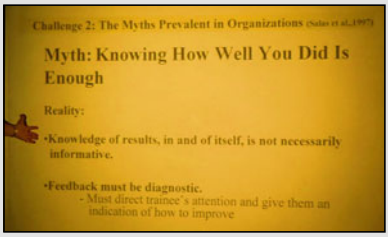
So, my question is: Would it not make ethical sense for the simulation/gaming associations to draw up codes of ethics or ethical guidelines? They should cover all aspects of simulation/gaming, such as design, facilitation, debriefing, publication and facilitator training, and they need, of course, to include clear guides about debriefing. Almost the only simulation associations that concern themselves with ethics seem to be those working with medical simulation, such as the Society for Simulation in Healthcare (SSH) (see Park et al., 2018) and the International Nursing Association of Clinical and Simulation Learning (INACSL) (see Decker et al., 2013, 2021).

However, as far as I know, all the general simulation/gaming associations have failed to produce a code of ethics for simulation and debriefing. I have in mind the SAGAs, including the well-established, Europe-based, International Simulation and Gaming Association (ISAGA) and the North American Simulation and Gaming Association (NASAGA), but also the more recent associations that have popped up (and sometimes faded) over the last couple of decades. The excellent article by my friend Marieke de Wijse-van Heeswijk (2021), titled *Ethics and the simulation facilitator: Taking your professional role seriously*, would be a good starting point for any discussion on a simulation code of ethics and, in that code, on debriefing ethics. Also, Roungas et al. (2018) and several medical simulation articles that mention ethics would be good sources from which to draw inspiration for a general simulation and debriefing code of ethics. Of course, games themselves are used to teach ethics, so why not design a simulation/game precisely to help develop an ethics code for debriefing? See Box 2 for two early efforts in which I was involved.

Box 2. Precursors to ethics for debriefing

This absence of a codified ethics for simulation/gaming is not for lack of trying. Many years ago, in July 1993, my friend, Kiyoshi Arai, Dick Chadwick, myself and others organized an International Conference on Professional Standards in Simulation, in Fukuoka, Japan. This by-invitation-only conference was intended to propose and debate professional standards, ethics and ideas related to the future development of simulation/gaming. Several draft documents were produced, but nothing, as far as I know, was published. (I may still even have some of those documents on an old hard drive. If anyone would like a copy, let me know.)

In 2002, I was invited to an inspiring meeting (http://medical.simulation.free.fr/) on the topic of training facilitators of medical simulation. This was in the early days of medical simulation, and it also gave impetus to the development of ethical principles and practices. Debriefing was an important theme, as illustrated in this photo of Edwardo Salas giving a presentation. Two top airline pilot trainers were also there and emphasized the importance of debriefing. Another attendee was Dave Gaba, who later went on to write an influential article on debriefing (Fanning & Gaba, 2007), and to set up the Society for Simulation in Healthcare (SSH) and found the journal *Simulation in Healthcare*.



6.3.6 Purposes

It is this context, recognizing the imperative of ethics, to which I can now return. Here I outline the main reasons for which debriefing is conducted after or during events, whether they be games, simulations or true (non-game) experiences, such as an internship, field trip, team project, research project, natural disaster or an accident. Several broad and overlapping purposes can be identified, such as learning, operational and relational (behavioural), both for simulations and for non-simulation situations. Some are listed in Table 6.4.

Personal sharing. Much writing on debriefing tends to overlook what is probably the most common form of debriefing. This is something that most humans on this planet indulge in as part of their every day, usually social, lives and as a matter of course. It is so taken for granted that it goes almost unnoticed—unnoticed, that is, until someone transgresses an ordinary social rule, such as "do not talk too much" or "you are not supposed to say such things" or "showing your emotions inappropriately in public is not good". This common-and-garden debriefing happens as a part (large part?) of our small talk, among family members, friends and colleagues, at home and at work, over meals, strolling, and in any place where two or more people come together in an atmosphere of relative trust.

You may have noticed that many people, probably including yourself, love to go for a walk together and chat about stuff or to have a coffee together and exchange ideas, thoughts, feelings, worries, experience, successes, expectations and so on.

Table 6.4 Some reasons for using debriefing

• Celebrating hard work • Troubleshooting challenge • Building relationships • Providing closure • Making plans for the next activity • Build and develop leaders • Reward successes • Identify opportunities for future training • Marking a pause in a long project • Finding the solution to a problem • Sharing experiences of people back from separate missions • As part of research, e.g., for clarifying issues and scenarios at the end of psychological studies (sometimes termed deception studies) • Increasing team effectiveness • During and following internships • At the end of an underwater dive • Celebrating a win • Taking stock for a team	• Providing opportunity to hold people accountable for closing down a project • Providing an occasion to reinforce goals • Wrapping up tasks • Critical incident debriefing (CID), also known as critical incident stress debriefing (CISD), e.g., after a traumatic experience (e.g., natural disaster, violent incident, traffic accident) • Following and during (long) visits to different cultures • Planning for a project • At various points (typically) at the end of a real or simulated medical intervention • Cheer people up and reassuring them after a failure • Gathering information at the end of a project or a field trip or exploration • At various points in professional training (e.g., flying)

People like to gather in a restaurant and reminisce about times that they had together; they like to call each other up or go online to share (even vaunt) their success (partly to get more pats on the back; nowadays it is often in the form of "likes") or to commiserate with someone over an unhappy or tragic incident (partly so that the sharing helps them to feel that the weight is lightened and that they are not alone). In our increasingly I-me-and-myself world today, people even do it in some media and on TV—generally in the often frivolous chat shows that have proliferated around the world.

Sharing experience—or debriefing, as we call it—is an activity that most people do naturally and spontaneously, for a whole variety of purposes—often unawares—see Box 3. In our more formal debriefing episodes as part of simulation and other learning events, we need to remember and draw on that natural tendency (or urge) that people have to share, especially with others who are likely to understand and with whom we have shared a common experience in a simulation?

Box 3. Spontaneous, natural debriefing

My own experience demonstrates to me this natural tendency that people have to wish to share experience, to debrief. Most weekdays, I walk down to the bus stop to meet one of my daughters, back home from the university. All it takes is one little expression, "so?", and they will talk all the way home about their class, what they learned, their latest grade, an upcoming exam, the homework that they have been given and so on.

Operational. An example of operational debriefing is when an individual, a group or a team (in a simulated or a real situation) needs to assess work performed or action accomplished, the manner of performance and what was or was not achieved. The purpose here is to discover what was done well and what tasks could have been done better and to deliberate on what changes should be made and how to accomplish such changes.

This type of debriefing helps individuals and teams to learn, and to learn to learn. At work, this is mostly carried out in a formal or informal meeting and often without regard for the important elements or structure normally associated with a formal debriefing. With increasing desire (or pressure) to sound technical, organized, modern and even authoritative, the term *debriefing* is increasingly used for such meetings.

However, the term alone accomplishes little; it is the content and practice that counts. Real, operational debriefings are common, such as in mountain rescue crews (e.g., the impressive PGHM, Peloton de Gendarmerie de Haute Montagne, in the Mont Blanc massif), sea rescue (e.g., Société Nationale de Sauvetage en Mer), police interventions, fire brigades, Antarctic exploration, research excursions, mountain expeditions, public festivals, commercial campaigns and many other kinds of events. This is where the term *event* takes on its usual force, although the events industry still seems to be oblivious to the advantages of debriefing and thus to fail to learn fully from the events that they organize. Box 4 contains a personal example.

Box 4. Operational debrief after a dive

My personal experiences with operational debriefing have occurred most when diving. Before leaving the dive boat, we would be briefed by the dive master. After returning to the boat, and over a well-earned lunch, the dive master would debrief the group of divers. We would talk about difficulties that we encountered, get answers to technical questions, learn about the flora and fauna that we observed, and consider how to do better for the next dive. Of course, here, the urge to talk is even greater than in most other situations because one cannot talk underwater (unless one is equipped with special and expensive apparatus). One might characterize this type of debriefing as both operational and personal sharing. (The photo is of me during a diving expedition in Thailand.)

Often the debrief feeds into the next step of operations, such as in-team training or the next dive. Operational debriefing provides a powerful opportunity to assess problematic and successful strategies, with the aim of moving forward in a positive and constructive manner, for the people concerned in particular and, ultimately, for

society more generally. This type of debriefing may include, and often overlaps with, relational and behavioural debriefing.

Relational/behavioural. A debriefing session can be organized with the purpose of helping to improve relations among people or to help people to correct behaviours so that they are more appropriate for a given setting. It may also be used to understand a common experience, such as a research expedition or a field trip, in which relations may become strained (partly due to situational stress and hardship). It may be to take stock of progress in an ongoing improvement programme.

On a more individual level, relational or behavioural debriefing might aim to help the person to make clearer sense of events, to integrate their experience into their life as a whole, to perceive their experience more meaningfully, to bring a sense of closure to an event or to bring peace to a conflict (among people or in oneself). Strong debriefing skills are needed in unethical, unprofessional situations, such as in an expedition, where a junior female explorer is harassed or worse. All expedition leaders and their assistants need to be skilled in debriefing. Sexual harassment is not an uncommon event on some geoscience expeditions, and this has led to all-female expeditions being organized.

Debriefing can also be needed unexpectedly at the start or on the side of a simulation. See Box 5 for an unexpected incident (at the start of simulation), which was debriefed and thus helped one person find peace with playing cards.

Box 5. Unforeseen necessity to debrief outside of a simulation

Sometimes a particularly unexpected incident occurs and needs debriefing attention. Usually, it cannot be foreseen. An example of one that happened was during one of my workshops. I was co-facilitating a pre-conference SIETAR workshop with my dear friend Sandy Fowler (past president of SIETAR International and of SIETAR USA). The theme of the training workshop was using simulation for intercultural training, attended by some 20 professional interculturalists. Along with other games, we had decided to use Thiagarajan (Thiagi) Sivasailam's *Barnga*. This wonderful game uses ordinary playing cards, with players sitting in small groups.

Very soon after asking each table to distribute its pack, I noticed that one player in a group seemed uncomfortable. Other players had not yet noticed as they were focused on their cards. I went over to the player and asked if she was ok. She said that she could not play in this game, which had come as a bit of a shock to her in an intercultural train-the-trainer session. By now the other players in her group had become aware of the situation. I asked why, and she said that she knew why, but was shy of telling, and then the other players showed sympathy. I said that it might help if she shared with the group.

After a slight hesitation, she then proceeded to tell a story of how she had been mistreated at school when playing cards. That had put her off cards for many years and she had almost forgotten about it. Having to hold the cards for *Barnga* and being confronted with the idea of playing cards again revived her unhappy childhood experience. After explaining, with everyone listening carefully and showing sympathy [the group was composed of all women], she said that a weight had been lifted off her shoulders, and warmly thanked everyone. To everyone's delight she then declared herself willing to play *Barnga*. This, and not intercultural simulation, may well have been the biggest learning for her from that workshop.

Critical Incident Stress Debriefing (CISD). This is a specialized and structured form of personal debriefing, which needs to be conducted by trained personnel. It usually takes place after a traumatic experience, such as a natural disaster, a violent incident or a road accident. In this type of debriefing, ethics will play a particularly important guiding role. This chapter does not look at this type of debriefing as it requires special training and is not usually accomplished as part of a simulation. However, some of its elements may be useful for simulation debriefing.

Learning experiences. This is the area of application that concerns us most here, and on which this chapter focuses. The broad reason why debriefing is used in learning is primarily to ensure that an experience leads to some kind of learning. The range of types of experience is huge. A game, simulation or role-play must be debriefed. Other types of learning experience, such as values exercises, internships, field trips, expeditions and project work, do not always require debriefing, but can usually benefit immensely from some form of debriefing, adapted, of course, to the learning objectives and type of experience. For example, an internship is not usually debriefed, but it should be—see Box 6.

Box 6. Debriefing for internships—unethical omission by universities

In a couple of my university appointments, part of my responsibility was to 'supervise' master's students during their internships. This entailed site visits, meeting with the students' company supervisors and overseeing the writing of student reports. Several times I asked students to include a chapter entitled "how and what I learned". The idea (at least for me) was to allow them to reflect on their learning process during the internship, which after all constitutes a key learning experience in their studies. They would tell me "that is not in the guide for writing reports". So I asked "but is that not a key ingredient for learning from an internship?", "would it not be useful as part of your studies to reflect and write about your own personal learning process?" and "would it not be useful later in professional life to be aware of the ways in which you learn?". "Of course", they would say, without hesitation.

I tried to get the university administration to change the guide. To no avail. That is how education in general, and universities in particular, get stuck in a rut. More importantly, it results in millions of students missing out on an important learning opportunity. In other words, it is one way in which universities are failing in their responsibility to students—that is unethical, to come back to the ethics statement by Willy Kriz.

One student—a woman of Muslim faith, and for whom I was her internship supervisor—called me several times during her internship because she was being pressured, illegally, to take off her headscarf. We had several conversations (debriefings) about it. She obviously learned much from the experience; as I did. I encouraged her to put that in her end-of-internship report, but she was not comfortable doing that, even though it was important for her. "I cannot put my personal experience in there; they would not accept it".

You will, of course, have noticed that the above cases can be somewhat close to the situations created by participation in a simulation, especially ones in which emotions are generated and in which the participant is engaged personally as a whole person. In such cases, debriefing becomes paramount.

6.3.7 Issues

The above purposes are varied and raise a number of crucial issues, each of which should be considered when designing and implementing a debrief, depending on the situation.

Ownership and participant centredness. In our simulation debriefing, we need to remember that the natural tendency is for people to share personal experience, that the experience was lived by participants and therefore that it was *their* experience, not the facilitator's. This means that debriefing belongs to the participant and that we must not do what the traditional teacher tends to do—seize control and get in the way. We need to remember to avoid snatching away that desire to share by plonking ourselves in the middle. How would you like it if, in the middle of a quiet chat with your friend in a café, an acquaintance walks in and takes over the conversation and starts to tell you what is what and what your experience is and should have been, what it is right and wrong about it and indeed what you must understand from it. I am sure that you would be disappointed at best and thoroughly annoyed or more at worst. This is similar, mutatis mutandis, to many simulations, debriefs that I have witnessed (as participant, as observer, and even—in my early gaming days—as debriefer).

Later, in the section *Who*, we will look at this dichotomy of teacher-focused and participant-centred debriefing. For the moment, it is worth wrapping your head round the idea that people's experiences and their sharing of them belong to them, even more so when it is a learning-oriented debriefing. It is fundamentally a question of respect and even rights. In the end, one must ask: What right does a teacher–debriefer have to jump in and quash participants' words, feelings and thoughts?

Stress. Some simulation sessions can involve emotional stress. The greater the stress in a simulation, the greater the need to conduct debriefing sessions that allow the stress and emotions to be shared, released and understood. Only after that has happened will participants be ready to move on (as mentioned above) and think about the more cognitive aspects of their experience. See a concrete example detailed in Boxes 7, 8 and 9.

Box 7. Emotion-generating simulation

During my stay in the USA, I taught a master's level class for trainee teachers. One of the classes was about understanding the learning process and the learners' viewpoint. The rationale was that many trainers and teachers over time tend to forget what it is like to be a learner, especially during moments when teachers and peers heighten the pressure to perform or learn.

I remembered a simulation called *Me The Slow Learner*, designed by Don Thatcher and June Robinson. I remembered participating in a prototype version during a SAGSET conference in the UK and run by Don himself. I was both moved and intrigued by the simulation. I was also impressed by Don's manner of conducting the game and debriefing. Don was an excellent game designer and one of the best facilitators ever in simulation/gaming. While I was Ed of *S&G*, I invited Don to guest edit a special issue because I wanted people to know about his work.

For my master's class, Don's simulation immediately came to mind as an effective and affective way of getting future teachers, who had even by then forgotten what a challenge it is to learn certain things, and thus to get future teachers to understand something of the learning difficulties of their future students.

The simulation is fairly straightforward. It consists of handicapping participants so that they find it difficult to accomplish simple tasks. For example, I bandaged students' index and middle finger with tape, gave them a blunt scissors and told them to cut a clean square in the middle of a piece of paper. They had a list of tasks to accomplish. During this time, students were not allowed to talk and I berated them noisily for sloppy work. As you can imagine, this was a rather stressful moment, even though tasks only lasted a short time (about 20 minutes). (Cont. in Box 8.)

Box 8. Emotions and participant-centred debriefing: A memorable and learning experience

(Cont. from Box 7.) I planned to do a short debrief before the end of the class and a full debrief the following class (about three days later). Soon after the start of the debrief, one student broke down in tears. The rest of that debrief was given over to listening to her. By the end of the class, she had calmed down and reassured me and the other students that she was fine. The students left the class with a debriefing form to fill, asking questions about their experience.

In the second, class-long debriefing session, everyone shared their emotions and their experience. The person who had cried in the previous class again attracted everyone's attention. She explained that she had broken down because the handicap experience in the simulation brought back to her memories of a time in her childhood when she had been forced to learn things for which she was not ready and in a strict school environment. She explained that these memories came flooding back as we started the short debrief, memories that she had almost forgotten, "almost" because she had not spoken about them for several years—as no one would listen to or believe her. She explained that her simulation experience and being able to talk about her childhood experience were liberating for her. She said that she felt that a weight had been lifted and that she was glad to have been in the simulation.

At the end of the second class, I asked students if they wished to move on to the next item in their syllabus or if they wished to debrief further. Unanimously and strongly, they expressed a desire to continue with the debrief.

Thus, the third class was taken up with a second class session debriefing. In the end, the students said that would be like a third whole-class debriefing, which we did. So, one class of simulation lead, unexpectedly for me, to three classes of debriefing.

In a way, I feel grateful to that class and especially to the student who had the courage to share what was, after all, an intimate experience from her private past. See also the lessons that I myself, as a debriefer, learned from this experience, in Box 9.

Box 9. Lessons from debriefing *Me the Slow Learner* (Thatcher)

(Cont. from Box 8.) The lessons for me in debriefing *Me the Slow Learner* in a master's class for trainee teachers were:

- You can never overestimate the time needed for debriefing.
- You have to expect the unexpected (as I think Ellysbeth Leigh would say).

- As a result, you must be flexible in allocating enough time for participants to debrief as much as they express the need to do so.
- If necessary, you must be ready to drop elements of a pre-decided programme, such as items in a syllabus, to make way for extra or unplanned debriefing.
- You need to plan more time than you think will be necessary, it being better to end before time than to run over time and find yourself in a crunch.
- You must stay focused on the participants' emotions, experience, sharings, ideas, and not attempt to take them over and place them into your own pre-conceived idea of what and how they should have learned.
- You should always respect the learner's own freedom to learn. It is their process, not yours. That does not mean that you cannot intervene, but intervention should be done at the right moments and in appropriate ways, when the participants are ready, not when you want. All that takes time.

Of course, it should be kept in mind that it is not the calling of a debrief per se, the decision by you to debrief, that accomplishes the work. It is accomplished by participants' effort during, and after, the debriefing. Seen in that light, debriefing can be a stressful time as well as a liberating and eye-opening moment. Much depends on the event being debriefed, the facilitator (debriefer), the manner of debriefing, the mindset of the participant and other factors. One important factor is the participant-centredness of the debrief—how much participants are allowed, indeed, encouraged to take ownership of their debriefing session. This will be discussed further in *How*.

Some people seem to be shy of mentioning debriefing—as if this was not really the thing to do or as if participants might not like it. 'Understandable,' they might insist, 'for after an exciting game, what could be drearier than talking about it?'. Make no mistake, most learners will be grateful for the opportunity to share their common experience together, especially in a structured, learner-centred debrief. Most of the classes that I have taught involved some form of debriefing, and as time went by, the relative time spent on debriefing increased and the focus was increasingly on debriefing.

The students learned that no game would be without a debriefing. Over a short period of time (two or three class periods), they learned how to debrief in their small, participant-centred groups. I would not infrequently hear, at the end of a game, a student spontaneously and eagerly say something like "ok, let us now go and debrief" or "come on, we have to debrief, then we can learn". They would then organize themselves, draw up a few chairs into a circle round a small table, ask for the individual debriefing form (see below, in *How*) and focus on the debriefing process. In the same way that simulation provides a relatively safe, controlled and mistake-tolerant system for participants to explore, so should debriefing provide a safe setting for them (and you as debriefer, or better as debriefing organizer) to learn and make mistakes.

Social issues. An ordinary classroom is often conducted as if all students were the same. How many times do we hear teachers and authorities insisting that all are treated equally, for fear of being accused of favouritism and other ills. In such a classroom, social relations, realities of the real wild, feelings and individual identities are left at the door, and the teacher carries on merrily (or not so merrily) with teaching about *Les Fleurs du mal* (a collection of poems by Baudelaire, 1857) or sine and cosine in trigonometry, as if they were totally separated from, had absolutely nothing to do with, the learner. Both teacher and student breath signs of relief when the end-of-class bell rings—a real case of saved by the bell.

This is difficult with a simulation/game and impossible in debriefing. Each participant in such an event brings with them their own individual feelings, prejudices, preferences, ways of thinking, socially-marked accents and ways of talking, their beliefs and fears about the world and other people. Their experience (often unawares) of inter-group relations, gendered ways and a whole host of characteristics that are interpreted by fellow participants, all mitigate or enrich participation in usually unforeseen and imperceptible ways. In the simulation itself, such idiosyncrasies may manifest themselves in unsurprising ways, as they do in everyday life, and they may enhance or cloud game objectives and other factors. However, when it comes to debriefing, these elements may well come to the fore and be seen in a clearer light than in everyday life. (See, e.g., my job-interview simulation sequence, outlined in the Appendix).

6.3.8 Fidelity: A Fundamental, Practical and Ethical Reason for Debriefing

The above discussion will have given you an overview of several reasons why you should debrief. However, a further reason underlying most of the reasons above is related to what one might call the inevitable lack of simulation fidelity or the hiatus or mismatch between a simulation and its referent situation (the real-world situation represented in the simulation). Most simulators and simulations by definition represent only part of the referent system. They do not and cannot achieve absolute fidelity. If they did, it would be reality itself—the referent situation—and thus the simulation would be superfluous and the reality possibly or probably dangerous.

Imagine, for example, an airline company inviting a novice pilot to fly a real Airbus aircraft with real passengers. Would you be happy to be on that flight? A real aircraft and a high-level simulator are just too complex for a novice or even an intermediate learner pilot. Learners need to progress in steps or degrees of complexity—or of fidelity to the referent system. Three levels are depicted in Fig. 6.3.

Fig. 6.3 Levels of fidelity for flight simulators: beginner, intermediate, advanced

Simulation infidelity is not always examined in a debrief, even though it is a key to learning (see Box 10 for an example in aviation). I like to raise the debriefing of simulation infidelity with a question like "what are the differences and similarities between the simulation and reality (or the real-world referent situation)?". This lack of fidelity has often posed a dilemma, discussed by the more theoretical simulation scholars. The basic question is usually: How faithful should a simulation be in order to achieve the learning objectives for which it is built?

Box 10. Flight simulation
One concrete experience that I was lucky enough to have had was to fly an Airbus, well, to fly a simulator of an Airbus. This was during the Singapore ISAGA conference. After the excitement of flying over Rio, with help from the professional trainer, we chatted, and I asked him about debriefing. I remember to this day how clear he was in emphasizing how crucial debriefing was in all their training. The simulator records every decision and movement, and later during the debriefing, they can play back the sequence, discuss and then try again. It is also the debriefs that allow trainee pilots to move up levels of fidelity (see Fig. 6.3). Aircraft simulators would not be worth much without debriefing. Medical simulation experts understand this too. All areas using simulation need to learn from aviation.

A simulation that reproduces extremely faithfully the simulated or referent situation could turn out to be far too complex for beginners and intermediates to learn. A simulation that is too simple and represents just a few of the referent situation characteristics is unlikely to be of much use to the advanced learner. This is partly why apprentice pilots progress from fairly simple trainers, through more complex simulators before moving to full-blown advanced aircraft simulators—Fig. 6.3.

However, the above question and concern with level of fidelity of a simulation for learning often misses the point. It is not always or so much the fidelity of the simulation, but how the debriefing is conducted. Thus, talk about simulation fidelity cannot omit talk of debriefing fidelity. The central question should be how and how far the debriefing helps a learner to move towards the real-world complexity from the starting point of the simulation, its level of fidelity. Some people get excited

about the high fidelity of their simulation. This is okay for research and exploration purposes (such as for climate and meteorology), but for learning, they should get excited, instead, about the ways in which their debriefing (built into their simulation) can help learners attain the desired complexity. It is the debriefing that helps to bridge the gap between simulation and reality. Indeed, it is this 'gap' that ethically and learningly requires debriefing—see discussion in the next section.

We should also not forget the immense capacity that the human mind has for imagination. In many ways, one could say that radio is better than television. On the radio, the landscapes and views are far more beautiful than on television. Of course, they may not be as accurate, have as high fidelity to reality, but in some cases, it does not matter.

That idea brings us to an added danger, often referred to as the Dunning–Kruger Effect (Kruger & Dunning, 1999, 2002); see also Dunning–Kruger Effect (2023). This is that the learner may assume that s/he has learned perfectly, when the opposite is true. Let us take our three levels of flight simulator as a concrete example of the kind of situation that a simulation participant might assume. A novice may train thoroughly on the level 1 or level 2 simulator and be able to make perfect take-offs and landings in that simulator. It is not inconceivable that the novice could then assume that s/he has become a master pilot and assume that s/he can already fly big aircraft. That is, however, unlikely in flight training programmes, which are usually tightly controlled. These considerations also hold, mutatis mutandis, in maritime and navigation simulation and debriefing (see, e.g., Sellberg & Wiig, 2020).

However, in other situations, it might present a real problem. In some training situations, learners move up levels. It could be that a participant, having taken part, for example, in a team building simulation or in a doctor–patient simulation, assumes that they have mastered all the necessary skills. They then find themselves in a real situation, assume that they know what the reality is, and then make massive blunders—simply because no debriefing was done, debriefing in which they would learn that their learning journey is just the beginning. This is the kind of situation that ethics requires to be debriefed.

Thus, for most learners, a simulation will not represent the referent situation in its entirety. This means that learners in most simulations participate in a system that bears only superficial or partial resemblance to the real-referent system that they are supposed to be learning. Because learners do not yet know what the referent situation is really like, they will not have the elements (knowledge) needed to detect what things in a simulation do not correspond to the referent system or indeed what things are different from the referent. Learners need to know what things are different from and even what things contradict the referent. Unless this fundamental discrepancy between the simulation and the referent is debriefed adequately, we could be withholding learning at best or teaching something perverse at worst. (More discussion on such issues can be found in much publication on simulation,

e.g., Angelini, 2021; Becu, 2020; Cannon et al., 2009; Crookall et al., 1987; Duke, 2011; Greenblat & Duke, 1981; Peters et al., 1998; Teach, 2018; Wardaszko, 2018. These issues are also of concern in medical simulation, e.g., Massoth et al., 2019.)

6.3.9 Paradox and Dilemma of Simulation: Need for Debriefing

The paradox or dilemma that we must confront calls for some practical theory, as Fred Goodman might have said (Goodman, 1995). The paradox in thinking about simulation as a means to learning and the dilemma with which we are confronted as practitioners are that simulation is not a straight path to learning, indeed it is a roundabout way. We ask learners to leave (the comfort of) their ordinary reality and embark on a journey to another (simulation) world, and a make-believe one at that, and one that then also requires suspension of disbelief, with which some people have problems. They are asked to treat this new (simulation) world as if it was the real (non-simulation) world—quite an ask, really. It can be a new world in which they encounter totally new things, encounter disruption, see themselves in a new light—in other words, a world that can be somewhat disorienting for some, even traumatic (as I have related in Box 7). We then say to them, even insist, that they will learn in this unreal world. We assert that our learners will learn about the real world from this other (simulated) world—maybe contradicting the adage "you learn what you do".

It is often said that we learn more about one's own culture (or country) by visiting a foreign one, but that learning takes time—the learning comes from usually informal debriefing—talking with friends and family, maybe reading about intercultural communication. Then we find (usually unexpectedly) that we cannot go back fully to our old world for it has changed—usually because we have moved on and grown through our experience. Our original country will never be what it once was. Yes, our country (our situation) and we change over time, but relatively slowly, which gives us time to change (adapt). One problem, then, in simulation is our and often participants' expectation that they will change fast and easily. Relatively to our normal everyday speed of change, we expect simulation participants to make massive change at great speed. Here and for all debriefing, we must remember that learning and change are synonymous. We cannot learn without changing; change usually entails learning.

After a while in their new country (simulation), maybe just when the learner is beginning to settle down in their new (simulation) culture, we halt that world, and again ask the learner to embark on another journey. We might be tempted to think that it is merely the previous journey in reverse. However, their strange experience in this unreal (new, becoming familiar) world means that they can never return to where they started. Intercultural travellers will have experienced this somewhat as they move into a new culture, and then return to their home or starting point, never

to feel the same about their home or about themselves. We learn much about our own culture by going to live in another and then return, never to see one's home in the same way. When adaptation (change/learning) happens too fast it can result in what is sometimes known as cultural re-entry or reverse cultural shock. To understand more on cultural adaptation (and thus on what we ask our simulation learners to do), see a wonderful book by my friend, Young Yun Kim (2000).

Thus, the simulation learning path is a roundabout and rather tortuous one, but one that can be made clearer and straighter with some good debriefing. Let me simplify. In most learning paradigms, from classical chalk-and-talk, sit-in-rows and listen-to-teacher formats to learner-centred and experience-based project work, field strips and internships (among others), the basic idea is that we lead the learner from a starting point (of unknowing or not understanding) to the destination (of knowing, understanding and capability or skill competence). The knowing can be knowing that or knowing how (as Gilbert Ryle expressed it). The path is said to be relatively straight, but rarely is.

However, in simulation learning, we complicate that already difficult path with a massive detour, something that some learners may perceive as a clumsy clanger on our part. Learners new to simulation sometimes wonder "what on Earth are we doing this for?", "what has this got to do with my class?" or "I did not come here to play games". For us, simulation practitioners, it is so obvious that "they will learn", that we do not think twice and that we see no need to explain anything about it. This phenomenon of rejection on the part of some potential participants may account in part for what my good friend Danny Saunders calls "the reluctant participant" (Saunders, 1985). Thus, part of the briefing before a simulation with newcomers needs to include sufficient explanation and reassurance about the whole process and about debriefing for the learners to understand the principles at the very outset—to provide pointers about the journey on which learners are to embark.

The paradox (for simulation theorists) or dilemma (for practitioners) is that learners are expecting to enter a "normal", familiar straightforward learning setup, but we 'throw' them into 'this thing' that we call simulation or game. At first sight, this thing may appear rather strange, especially as it may look thoroughly different from (the future participants' idea of) the referent situation that the learners are expected to reach or learn about. The paradox or dilemma is that we take learners on a detour through an essentially imaginary world to help them reach a new referent world, often doing little more than simply hoping that they will survive and learn. This detour is illustrated in Fig. 6.4. I say a "new different world" because the experience of participation and debriefing will have changed the participant, even if only a little, and they will thus contemplate the world through new eyes—see the above discussion on cultural adaptation. As mentioned above, this different world might be experienced as a journey to a strange land with a complete change of scenery and culture. Indeed, this is somewhat similar for some cross-cultural travellers, for whom the return home (re-entry) can be more disorienting than the outward-bound journey.

In Fig. 6.4, the standard, classical path of learning is symbolized by the thick, squiggly, brown line I at the bottom, taking the participant P (bottom left) directly towards their learning goals or referent system R (bottom right), along path H, which is usually taken for granted as straightforward (in the literal sense of the word). In some cases, they do not fully reach their learning goal, partly because they have to jump over, round and through crazy hurdles (usually called exams, and which have little to do with their learning goals, their career path, their individuality or indeed life).

However, in some cases, the referent system may not be possible to experience, for a variety of reasons, for example, the referent system does not exist physically, or it is too dangerous, or too fast or slow, or too big or small. We, thus, substitute a representation of the system, which we can observe or manipulate or experience.

In some cases, the referent system exists, but is configured in such a manner that direct experience for practice is not possible. One example is training in job interview skills (see Appendix). The real situation of a real, live job interview cannot usually be accomplished in a classroom. We, therefore, create a substitute, one that we consider as being sufficiently equivalent for the learner to gain meaningful experience as if it were real—we design and conduct a job-interview simulation+debriefing.

This immediately involves quite a big detour A (blue arch). It is a journey B (orange arrow), along a strange path C, towards and into the simulated job interview

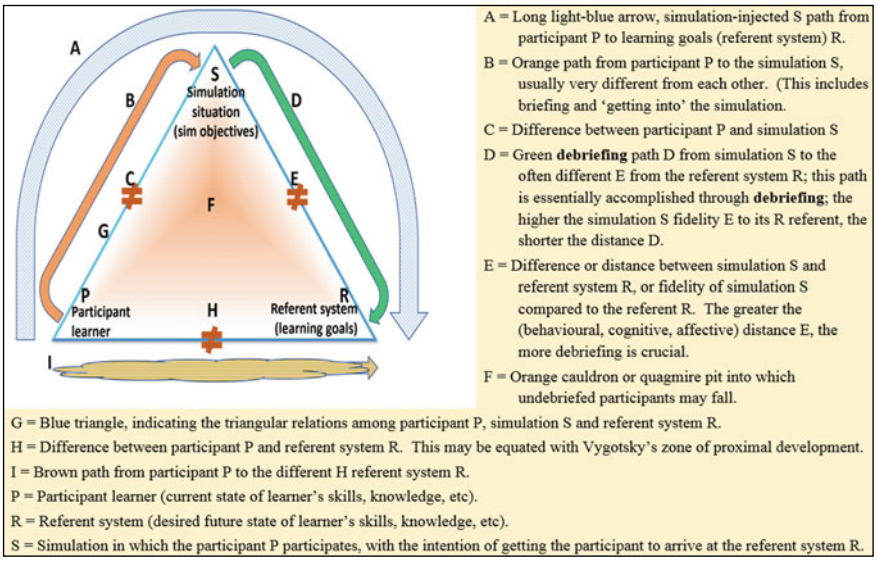


Fig. 6.4 Triangle of relations among participant, simulation and learning goals

S (triangle apex), and then another journey D (green arrow), along another strange path F, from the simulation S to the real job interview R (bottom right), where the student hopes to be offered a real job.

This, by the way, is also an example of how debriefing may help a person to learn from the real situation. The steps, techniques and questions that the learner has learned from a job-interview simulation can subsequently be used to debrief a real interview.

Another example might be negotiating and writing an international agreement for ocean conservation—path A. It is well-nigh impossible for a group of students to be parachuted into some real, high-level negotiations R; first, they do not have the skills; second, they would simply not be allowed. However, a group of learners may be taken through a simulation S in order to experience something of the agreement negotiation and writing process and hone the skills needed for that as well as learn about the knowledge involved (e.g., ocean degradation, acidification and overfishing). Their path D, from simulation S to referent system R, must of course be accomplished through appropriate debriefing. It is clear that the path P-S-R is far longer than the path P-R. It is longer cognitively, emotionally and behaviourally. However, we gamers assume that P-S-R is more effective (especially in the long term) than P-R. I would add that it is more likely to be more effective if proper debriefing is accomplished in S-R leg of the journey. If need be, briefing should explain this.

One purpose of this debriefing is to close the gaps between the simulation S and the referent system R. If no debriefing D is done, the participants might simply remain at the Simulation S stage, and never understand that the referent system R is partly or considerably different. They would come away from the simulation with an inexact, and maybe even dangerous, image of reality.

Another major purpose of debriefing for path D, especially in the learning R of skills of all kinds, such as job-interview skills, is precisely to transform and transfer their simulation performance S into better skills and deeper knowledge in order to operate successfully in reality R, for example in a real job interview R.

We need to have a good reason to drag someone away from everyday reality and plunge them into a strange, alternate-reality, non-real-reality world, and then to snatch them from that simulation reality and thrust them back into the real world. Of course, suspension of disbelief helps, but that suspension requires trust—we ask the participant to trust us to take them on safe travels, a journey that will deliver on our promises of learning the goals that we set. As we all know, trust is easily broken, even inadvertently, and—like Humpty Dumpty—is hard to put back together again. If trust is broken, then disbelief comes tumbling down, and we will have, not reluctance, but refusal to participate. For trust to remain intact and for promises to be kept, debriefing must be accomplished well. Maybe part of the answer to the question that my friend Dick Teach (2018) asks: “Why is learning so difficult to measure when ‘playing’ simulations?” could simply be “because debriefing has been insufficient or improperly conducted”.

6.4 Whither—Goals and Objectives

The word *whither* implies goals or objectives. Much literature has been devoted to the fact that debriefing contributes to learning. I say "fact" because several studies have actually shown that debriefing is indeed an important contributor to learning. However, I would suggest that we (participants, trainers, debriefers, debrief-ethical gamers) do not need hard 'scientific' proof because we witness the effect every time that we do proper debriefing. My students who spontaneously speak aloud at the end of a game and say "ok, let us now go and debrief" do not need any proof. They realize it first-hand through concrete, hands-on, participant-centred experience —"realize" in both senses of the term: understand and make it happen. It is important here to make a short, but crucial detour into objectives.

In life as in simulation, people are concerned with objectives, goals, purposes, aims, targets, intents, wishes, ambitions, missions, intentions and other ends. In simulation, it is useful for both facilitator and participant to distinguish between two types of objectives. These are game or **simulation objectives** and **learning goals**. The difference is crucial. During the simulation, participants are focused on reaching their simulation objectives, such as getting the most points, making an agreement, writing a treaty, finishing the interview, building the best tower or beating the others (individuals, teams). Once the simulation comes to an end, or is paused, then participants can set aside the simulation objectives and focus on learning. Thus, it is helpful to realize that only when the game stops, does the learning start.

When I was Editor of the journal *S&G*, I introduced a new section called *ready-to-use simulations*. Authors would format their game so that readers could copy the materials and run the game. Authors were required to indicate the purpose of their simulation, and to divide the purpose into simulation objectives and learning goals. Some examples of the huge difference between simulation objectives and learning goals are outlined in Table 6.5 and illustrated in Fig. 6.5. This is at the origin of my assertion that "the learning starts when the game stops", or even that "the game stops and then the learning starts".

During the game, participants are focused on playing the game, winning or accomplishing a task—that is, on the game objectives. It is, thus, difficult, while in the thick of the action, for them to step outside of the action and contemplate what they are doing, and impossible for them to think about and share their experience with colleagues. They are hardly aware of learning goals. Thus, very little (explicit, expressible) learning can take place.

It is after the game, during the debriefing, that participants can turn their mind to and focus on the learning goals. However, the debriefing must be accomplished in a deliberate and structured manner. The debriefing must, of course, derive from the game experience, and be centred around and on the participants. It is after all the participants who are doing the learning—not the teacher. This means that debriefing has to include both individual thought and collective sharing. The full sequence of game with observation (and presentation of the game product), followed by

Table 6.5 Examples of the fundamental difference between simulation objectives and learning goals

Simulation objectives (point **S,** Fig. 6.4)		**Learning goals** (point **R**, Fig. 6.4)
These are the specific **end-game criteria**; things that determine when the simulation ends, such as winning, getting an agreement, accomplishing a task, solving a problem and so on. **The game ends when its objectives are reached**.		These are the things that the participant, the game designer or facilitator would like participants to have learned by the time they have finished the (final) debriefing. These are ideal things in the referent situation that the participants are supposed to understand or for which they are supposed to perform better or optimally. **The learning goals start when the game ends**.
CockleSim	Write a roadmap to guide people in their behaviour towards climate change and the ocean.	Encourage people to work collaboratively to become ocean-climate-coast-literate, to help other people to become literate in the ocean-climate-coast nexus, in other words, to learn about the ocean, coasts and climate system, to behave in a responsible manner in that system and to realize the importance of passing on their knowledge and skills to others.
Chess	Capture the king by checkmate.	Strategy, thinking skills, concentration, operating under stress and several more.
Monopoly	Become owner of all the property, i.e., bankrupt all the other players.	Learn about monopolistic strategies and mindsets, and how these operate in society. (If the game is used to teach students, then it needs to be well-debriefed).
Barnga	Win a game of cards.	Become a better cross-cultural communicator and understand the roots of intercultural misunderstanding.
Fishbanks	Become the richest fisher by the time the end is announced, usually the ninth or tenth round.	Understand the tragedy of the commons, the limits to growth, the importance of trust, the need for cooperation, carrying capacity, complexity of balancing resources and allowing their regeneration and several other factors in fish stock and natural resource sustainability.
PROFFIteROLE	Hand over medication to a patient.	Improve pharmacist professional communication and procedures for medication delivery.
Towers	Be the team to build the best tower.	Understand, practice and develop teamwork skills.
Me the slow learner	Accomplish simple tasks under pressure, while handicapped and in an oppressive atmosphere.	Understand the difficulties of learning in general, and the stress of being a beginner in learning a skill.
Picture stories	In revolving groups, build a story from picture cards.	Learn creative story-making, vocabulary, sentence structure and past tense.

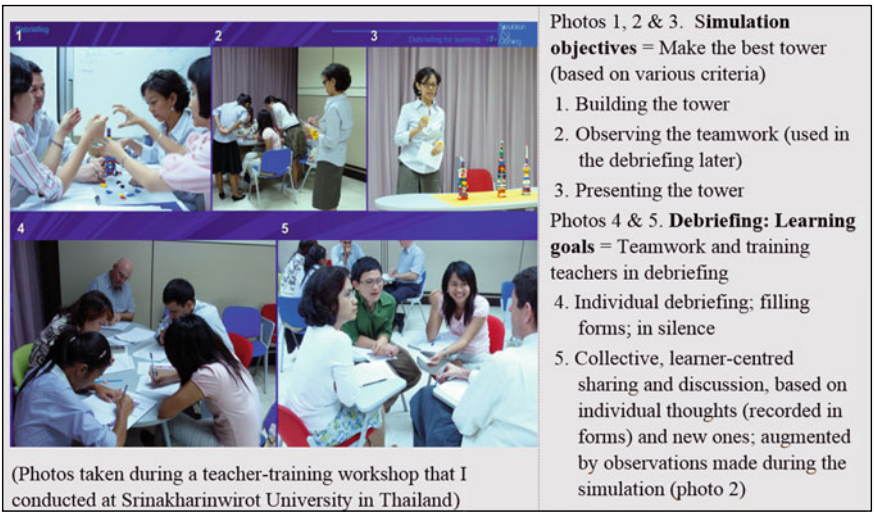


Fig. 6.5 Learner-centred debrief and distinction between simulation objectives and learning goals

individual and group debriefs, showing the distinction between simulation objectives and learning goals, is illustrated in the sequence of photos in Fig. 6.5.

If you keep those two things, simulation objectives and learning goals, clearly separated in your mind, it will help you facilitate both the simulation and the debriefing. Be aware that many ready-packaged, published or online simulations do not make that distinction (clearly enough). If you confuse the two, you are more likely to fall into Kriz's lack of learning and ethics trap.

6.5 When and How Many—Time and Sequence

Time (*When*) and place (*Where*) are closely related, and in practice, inseparable. Debriefing can take place pretty well anytime and anywhere. In fact, humans spend much of their life debriefing events and concerns. We debrief with a friend over a morning coffee about our concerns that our child is having a hard time at school. We may debrief with family or a psychology consultant after the loss of a loved one. During an evening stroll along the beach, we share our excitement about a good exam result or our worries about an upcoming job interview.

Those types of impromptu, unstructured debriefing moments occur mostly anytime and anywhere that is convenient. The more formal experiential learning events, such as games and simulation, are programmed to happen at specific times and in designated places and spaces. This, of course, determines the time framework for debriefing.

The timing of debriefing varies according to several criteria, among which are the simulation criteria and the learning criteria. Other factors here include number and experience of participants, total length of the simulation event, nature of tasks to be accomplished and (unfortunately) the time given to you by the school or university timetabling or by the company, which often thinks in terms of loss of work, instead of skills to be gained. For more discussion, see Secheresse et al. (2016).

6.5.1 Simple Sequence

The standard, and rather simple, way of looking at the steps usually follows the format illustrated in Fig. 6.6. Notice that the arrow head (end point or final goal) is the debrief, not the game. The debrief here is composed of one or more activities—more details in the section *How*.

Fig. 6.6 Simple, standard sequence

6.5.2 Complex Sequence—Several In-Game Debriefs

However, especially in larger-scale simulations, it is useful to conduct a debrief session at various strategic points throughout the simulation. Debriefing that takes place during a game is usually called in-game debriefing. This is particularly beneficial in simulations that last an hour or more. In-game debriefing is required (ethically mandatory) in large-scale and whole-semester simulations. In my semester-long simulations, I usually have a short (20–30 m) in-sim debrief once a week or a fortnight, and sometimes a more substantial in-sim debrief one half or two thirds the way along. Of course, the main debrief must still be conducted at the end of the simulation, often along with a feedback session. You can also get feedback on your own debriefing skills.

Some large-scale simulations actually have their own in-built debriefing as part of the basic structure, requiring individuals or groups to discuss a joint production. An example would be when groups negotiate and write a treaty or when they have to design materials for and get feedback from other groups. (One example is described in Crookall, 1991.) Note that this in-built debriefing may not capture all the learning goals, and a more in-depth (midway and) final debrief will be necessary. Thus, in your design phase, you will need to design the debriefing episodes

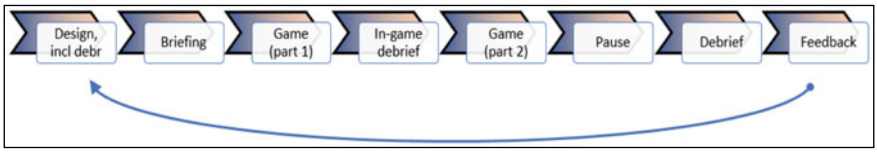


Fig. 6.7 Timing or sequencing of debriefing episodes during a simulation—in-simulation debriefing

along with the game. You cannot tack on in-game debriefs at the end! This is illustrated in Fig. 6.7. The blue arrow indicates that feedback on the whole process can help improve the design.

Table 6.6 provides a summary of the sequencing for debriefings during a simulation, from its inception till its conclusion. As you can see, the question of debriefing occurs in several steps along the course of a simulation. Of course, the main debrief must be conducted at the end of the simulation, often along with a feedback session. Thus, in your design phase, you will need to design the debriefing episodes along with the game. You cannot add on in-game debriefs at the end! For further discussion on some of the dimensions and issues involved in this type of debrief woven, as it were, into the fabric of the simulation itself, the article by Schwägele et al. (2021) is highly recommended.

Table 6.6 Sequencing for debriefing over the course of a simulation

Step	What to do
Design	Debriefing needs to be designed and built in from the very start of the game design.
Briefing	Briefing is an important part of any game. Participants need to know the rules, what may happen, what to do if rules are transgressed, what risks they face, and several other aspects related to their upcoming participation. It is important here to mention that, at various points along the way and/or at the end, they will participate in a debriefing. It is also useful, especially for first-time participants, to outline for them the rationale and function of games and debriefs, perhaps using Kolb's experiential learning cycle.
Game	The usual pattern is that the debriefing follows after the game itself. (See Fig. 6.6).
In-game debrief	However, it is often a good idea to stop the game for a while and organize a short debrief and then continue with the game proper. This is particularly suited to longer games, in which maybe some form of negotiation or research is involved. Material from in-game debriefing can then be fed into the next stage of the game and help participants to focus more clearly. (See Fig. 6.7).
Game 1, 2, …	An alternative pattern is to run several games, one after the other, each one with its own pause and debrief. Debriefing 1 can then feed into Game 2, and so on. (See Fig. 6.8).

(continued)

Table 6.6 (continued)

Step	What to do
Pause	A pause at the end of the game proper is usually a good idea, especially if the game has involved complex issues, raised emotional levels or involved high energy. This allows participants to recover from frayed nerves and tiredness. It also allows participants to de-role, to come out of role and slip back into their ordinary everyday roles. The pause can be anything from about 10 min to a week.
Debrief	The (main) debrief takes place after the game has ended. In terms of timing, the debrief can take place as early as 10 min after the end of play. This works well for games that focus on cognitive content (such as a physics game). If the game has generated strong emotions, it is usually a good idea to wait an hour, a day or even a week. Some participants may be more emotionally moved than others. You need to keep an eye on participants and ask those who appear emotionally moved or even upset to come and see you and let the other people leave. Then start a conversation by saying something like "you seem a little upset; please tell me more". Then it is your job to listen; you cannot counter; you cannot explain that their emotions are wrong. Once they stop talking, express your concern, and say that you hope that they will express those emotions to the other participants during the debrief later because it is quite possible that other people will have experienced similar emotions, without maybe showing it.
Feedback	An assessment of the whole process can be done in a feedback session or using a feedback form. It is usually better to get feedback outside the debrief. The debrief is for people to process their experience, not to evaluate the game or the way it was facilitated or debriefed. Feedback can then be fed into revision of the game. In addition, you can obtain feedback on your own debriefing skills (see Coggins et al., 2022).
Research	Beyond the simulation itself, if you decide to conduct research on a simulation or on some aspect of participation in a simulation or of outcomes from a simulation, you will also need to have collected data that relates in some way to the debriefing that you did. The research can be about almost anything, such as the effectiveness of simulation, the effectiveness of a particular simulation, the relationship between participants' expectations at the start and their perceived gains (or losses) at the end, the social-psychological challenges of participation in certain types of simulation, the perception of reflecting reality or their impressions of learning. That short list does not, of course, do justice to the immense variety of research topics done and to be done; many more will be found in the research literature (some referenced in the Bibliography). However, one thing that much research fails to do is to take into consideration and account for the debriefing that is done. It is quite inadequate in any simulation research endeavour to collect data about, for example, people's impressions of the simulation without also asking about the debriefing. In any research report (e.g., an article in a journal or a document on the internet), it is a serious omission to give no details about the debriefing materials and process used. It is inadequate and unethical in any research on simulation for learning or understanding not to provide proper debriefing that forms an integral part of the simulation. (For more discussion on research and possible research structures that take debriefing fully into account, see the Sect. 6.11.7 Research (below) and also the *Appendix—Possible Structures for Research on Debriefing*, in Crookall, 2010a, 2010b).

6.5.3 Several Linked Games, with Debrief After Each

I have also used a series of different (but similar games) one after the other. The aim is to teach a set of complex skills at different stages of complexity or fidelity, introducing new notions or skill sets with each game. I have used this successfully on a semester-long course on teamwork for master's students. Of course, each game must be debriefed. However, in a pattern like the one depicted in Fig. 6.8, the "Debrief 3" can be incorporated into the "Overall debrief" if this makes sense in terms of game content and learning goals. The design trick is to set up a system in which the debriefing results of one game feed into the next game. Background discussion on reflecting in and back on experience will be found, for example, in Schön (1990), Kolb (2015), Cattaneo and Motta (2021).

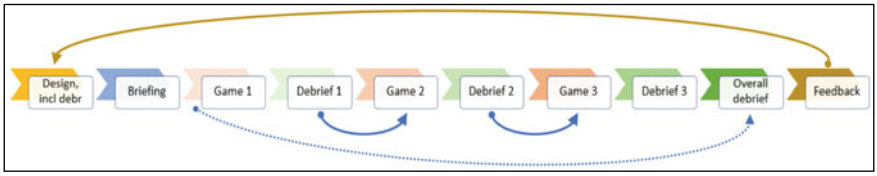


Fig. 6.8 Alternating games and debriefs, each debrief feeding into the next game

Length in time for debriefing. I have participated in games, after which the debriefing session was far too short, with the outcome being a feeling of frustration at having missed out on what could have been some important learning. Debriefing must be given the time that it needs for all participants to feel satisfied with the whole process. One problem with this is that some will want to finish before others. Generally, this is a small problem. It can be solved by letting people go and get a coffee, continue to discuss informally, which may sometimes give rise to a discussion on aspects related to the game that were not included in the debriefing.

It is difficult to establish even a general rule about length of time for debriefing. A rough guide, especially if you lack any other indication, would be to allow about as much time for debriefing as for the simulation itself. Thus, a two-hour game session would include one hour of game and one hour of debrief. For the second and subsequent runs of your simulation, you can easily adjust down or up. My experience is that as we get to know the simulation and its debriefing, the latter gets longer. We also tend to recognize areas that need more debriefing and thus increase the number of debriefing activities. An outline of possible factors that might influence your debrief times is provided in Table 6.7.

If your preferred style of debriefing is to bring all participants back together into a teacher-centred class, with you controlling rows of students neatly strung out behind lines of desks before you, the timing for the end of your debriefing session is not a problem—you control and decide. If, on the other hand, your predilection is to give control to participants in learner-centred debriefing groups, then you solve several problems related to the need for self-determined debriefing (discussed

Table 6.7 Factors influencing length of debriefing

Factor	Possible effects of various factors on length of debriefing
Proportion to game length	In your game design stage, it is useful to think initially in terms of allocating about 40–60% of the overall time to the debrief. It is fairly common for debriefing to take as much time as the game. It is not uncommon for the debrief to take three or four times the game time (see example in Boxes 7 and 8).
Type of game	The type of game may influence the debriefing time. Often the greater the complexity of issues, components and interactions in a simulation, the longer it is likely to take to debrief.
Participants	The characteristics of the participants will influence length of debriefing. Variables include age, maturity, prior knowledge, shyness, game experience, educational level, openness of mind, discussion skill level, prior experience of games and of debriefing, and several others.
Debriefing format/structure	The format or structure of the debriefing will influence its length. For example, a teacher-centred debriefing may last as long as the teacher decides or intuits as its proceeds. A participant-centred debriefing will last as long as they decide, which in turn depends somewhat on the participant's characteristics (see above).
The participatory experience	The experience of participants will influence the length of debriefing. If they have been deeply and emotionally involved, the debriefing is likely to last longer. Spare time at the end should always be made in case some participants wish to explore beyond the agreed time.
Over time (improvised)	Given that it is often difficult to know how long the debriefing or a segment of debriefing will take, it is important to plan for extra time. This can be an extension to the originally agreed time, or it can be organized the next day or in a week. If a week, then it is also a good idea to ask participants to do some interim work.
Extra time (planned)	In the first session (game and debrief) that I run with a group; I usually limit the time and finish the debriefing at a fixed time. In subsequent sessions, after participants have learnt in the first session what they have to do in a small-group debriefing, I start the debriefing in class and ask them to take extra time and finish it for homework. Sometimes the debrief can spread over several time periods (e.g., after class, next class, writing a portfolio—see next section).

elsewhere), but you create the potential problem of coordination of groups to end their small-group session at (more or less) the same time. Possible solutions to this fairly innocuous problem are discussed in the section on How.

6.5.4 Series of Debriefing Activities

It is customary to organize one single debriefing session. However, over the years, I have lengthened my debriefings into several varied activities, each one building on the previous, depending on the course, the participants, the learning goals, the type

of simulation, and other factors. For example, I tend to use the following sequence of four main debriefing activities: individual filling in forms in silence, sharing in small-group discussions, in class and then out of class, presentations linking debriefing to readings and (end-of-semester) portfolio. More details are provided in the section *How*.

6.6 Where—Place

Debriefing can take place almost anywhere. As mentioned above, we can debrief in a quiet café, in a garden and pretty well anywhere that is conducive to listening and thoughtful talk. These aspects are also important for more formal debriefing, so the place that you choose to conduct simulation debriefing should be quiet and peaceful, even though some noisy discussion does arise in small-group debriefing. Sometimes participants themselves will request to go to another place, see Fig. 6.9. If you are lucky enough to have nearby empty classrooms free, it is beneficial to spread out the debriefing groups across rooms; I found this particularly beneficial.

Of course, participants need to be comfortable. It is sometimes a good idea to facilitate the debriefing in an area that is different from where the game was run. This helps to mark a clear break from an area that may continue to have lingering emotional connotations, and maybe to dampen free expressing during the debrief. The game and debriefing can also take place online, using internet tools such as Google Forms and Discord.

I remember a place where participants requested to be outside. This happened in one of my workshops. I had been invited by my long-time and dear friend, the late Laurent Mermet, professor at AgroParis Tech, France, to attend a week seminar on environmental gaming. My task was to emphasize the importance of debriefing by running a workshop on the topic. The seminar was held in a wonderful castle - Château de Cerisy-La-Salle, built around 1620 – see the picture here (from https://en.normandie-tourisme.fr/museums-and-heritage-sites/chateau-de-cerisy-la-salle/).

I ran the workshop in the converted farm buildings in the background (on the left of the picture). The game involved a moderate amount of stress. As we were preparing for the debrief, some participants came up to me and asked if they could do their debriefing groupwork outside on the lawn. The weather was marvellous and so each debriefing group found a small patch of lawn to sit down and share their game experience. At the end, we held a plenary where each group shared their debriefing summary. They found that debriefing outside, away from other groups – and from me! – was particularly conducive to listening and discussion.

Fig. 6.9 Château de Cerisy-La-Salle

6.7 With What—Instrument

Related to place are the various instruments that you may use as debrief aides. Just as many trainings and classes use audio-visual and computer aides to 'deliver' material, debriefing can and should make use of aides where it enhances learning. As mentioned, debriefing can make use of electronic and internet tools. I discuss two here: video camera recordings and graphs generated from simulation decisions.

Video-aided debriefing (VAD). Probably, the most useful instrument to use for some debriefing is a video recording (camera) of some kind, in what is called video-aided or -assisted debriefing (VAD). The decision to use it and its method of use depend of course on various factors, such as the learning goals, participants, physical circumstance and preparation. The general pattern is that the participant is recorded during the simulation, and then the film is used to help with debriefing. As a rather general rule, video recording is used mostly in psycho-social-motor areas, such as debriefing a simulation for learning to improve body language in job interviews, pharmacy–patient encounters, intercultural interaction, doctor–patient interaction, teambuilding, language learning or manipulating a machine (car, medical apparatus, navigation, etc.).

The use of video raises ethical issues, which you need to resolve before you consider its use. You also need to come to an agreement with your trainees about how any recording is used and stored. In my job-interview skills training, for example, students use their own smartphone to record their simulated interview; the phone is held by a colleague student in the role of coach. I tell students that they will never be asked to show the recording in class, and that the only two people who will see the film are they and their coach, and for debriefing purposes. They are free, however, to show the film in class if they so wish, but the initiative must come from them. They get a simple form to fill in to help them analyse the film. Most students report that the film was useful in their own private, coach-facilitated, debriefing. It is particularly useful for them to see what they are 'really like', something that they could never get from in-class feedback only, either from their peers or from me.

> Debriefing augmented with information coming from a video … is believed to be even more objective, effective, and educational. (van Dalen et al., 2021)

> VAD was commonly used to enhance learning by showing what actually happened rather than talking about what was thought to have happened. There was a sense that video was particularly helpful in providing objective perceptions of time, space, and use of equipment. (Krogh et al., 2015)

At the end of the job-interview course, students must compile a portfolio. This is a kind of extended debrief and requires that they go back over their simulation experience, their video films and their debriefs—and relate it all to the literature on job interviews. It contains all their log sheets for classes, interviews and debriefs, the notes that their peers made about them during in-class and at-home debriefs, and stills extracted from their films, which they analyse for body language, and which

usually show much improvement from the first to the second simulated interview. I suggest to students that they keep their portfolio after the course and go over it before a real job interview as it can be a reminder to them of certain things to which they need to pay attention during their real interview. More information on this is in the Appendix about job-interview debriefing.

Graphs. Some of the simulations that I have run allow for the collection of data as the simulation proceeds. For example, *Fishbanks*, designed by my talented friend, Dennis Meadows, allows you to collect data about participants' decisions (e.g., N° of boats to send to the deep sea) and about the results of those decisions (e.g., regeneration of coastal fish). The teamwork-training game, *Towers*, can be configured to allow performance evaluations for various dimensions of teamwork, which can then be converted into graphs. See examples in Fig. 6.10, with more explanation in the Appendix.

Other classic games allow you to collect participant-decision data. The *NASA Game* specifically requires participants to record decisions, and then to calculate results at the end, before debriefing. My dear friend, the late Richard Powers, designed the *Commons Game* (Powers, 1992), which also allows this. More recently, the natural resource management game, *ReHab*, generates data that can be used in debriefing (Le Page et al., 2014, 2016). Some complex participatory simulations, sometimes using agent-based modelling, are able to do this (e.g., Becu, 2020; Bommel, 2020).

These kinds of graphs are especially useful for participants to use during their debriefing episodes, either in-class or at-home. Students are able to base their debriefing presentations and portfolios more easily and clearly on concrete and meaningful data that reflects their participation during the simulation than on unreliable recollection of the simulation and debriefing discussions.

Of course, these instruments need to be designed and tested well before you run the simulation. They also need to be adapted for each run of a game, usually because the number of participants and groups changes from run to run. Once a game is under way, you have no time even to tweak a bugging program (e.g., an Excel file).

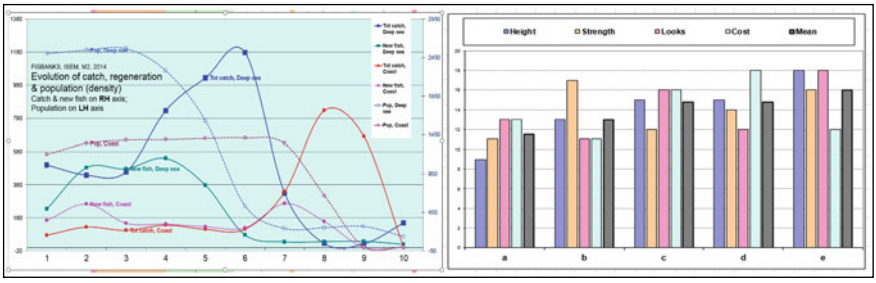


Fig. 6.10 *Graphs used for debriefing*—Fishbanks *and* Towers

Some games, mostly available online, will also display graphs about participant performance and progress. See the truly excellent simulators En-ROADS and C-ROADS, which provide real-time graphical feedback (Rooney-Varga et al., 2018, 2020, 2021; Sterman et al., 2015). However, in games, graphs are usually destined for use during the game. Little if any guidance is provided on using them for a debrief; that is because no guidance is provided for any debrief! What a marvellous opportunity for online game developers, if only they would take the trouble to seize it!

6.8 Whose—Ownership

Whose debriefing is it? To whom does a debrief belong? This is a question that is not often asked, and yet answers can guide us in our decisions for *How*—how a debriefing is to be facilitated. All too often, I have witnessed debriefings in which, at the end of the game, the facilitator asks everyone to "return to their places", usually returning chairs and desks back into rows, with everyone facing the facilitator, actually a teacher. In that short request "return to your places", the teacher has (re-)established control and ownership of the situation, its dynamic, its content and its communication—an efficient and sneaky way to kill the desire in participants to share with their peers their experience shared with their peers.

The idea of ownership has been a thorny issue of debate in educational circles for some time. This is not the place to attempt any resolution of the issue. However, for the moment, it may be worth drawing a rough parallel between the continuum of participant–teacher ownership and what I (somewhat loosely) call 'participant-centred' and 'teacher-focused' facilitation. This reflects Christopher and Smith's (1987) open and closed facilitation approaches. Leigh and Spindler (2004) speak of "traditional teaching and experiential facilitation", which "require quite different, and at times contradictory, skills and processes". My friend Elyssebeth Leigh has done much valuable work to encourage gamers to work within the participant paradigm, respecting participants' experience and pathway desires.

In debriefing as in games, ownership of developments should be with the participants. It is, after all, the participants who (are supposed to) do the learning. In some cases, the teacher can withdraw completely, although I would be careful suggesting that to colleagues in a dyed-in-the-wool conservative educational establishment, which most universities and many schools (still) are—almost by definition. In those establishments, learners generally have little (if any) say in what happens. However, it can be invigorating and liberating to experiment without asking authorities because learners will appreciate any sensible, learner-oriented, non-traditional action that you take to help them learn. My early experiment with a teacher-less class has encouraged me throughout my career—see Box 11.

Box 11. My best class, for which I was absent

Many years ago, I taught a course in a law school. Every week, I ran a small environmental rights role-play with some 15 master's students. One week I told them "next week, I cannot be here as I will attend a conference; would you like to try an experiment?". The, I must admit, somewhat hesitant answer was "ok". I explained that the procedure (read roles + game + debrief) was the same as they had been doing in previous classes with me present. I selected two students to whom I gave the materials, with a few extra procedural instructions. Two weeks later, I returned to class, with the students appearing to be pleased. I asked how it went. Their answer was "we never worked so hard before in class". I sometimes say that this was the best class that I ever taught. What this shows is that, with a moderate amount of guidance and preparation, responsible learners are perfectly able to take ownership of their learning, to make their own decisions about what to do for their learning and, crucially, to organize their own debriefing.

I must admit that this would have been impossible in some, more austere and conservatively-ruled, universities. I was lucky to have been able to experiment without being harassed by whips. In that sense, France provided me with a platform to experiment freely, an opportunity for which I am grateful. It must be said that, to experiment in that way, you need to establish a climate of trust with the university; they need to know that you are doing your job well and that the students are satisfied. However, I have the impression that French university authorities, in recent years, have been trying to clamp down gently on rogue facilitators.

That, Box 11, is not just to tell you an encouraging story. It is to emphasize that debriefing must be a moment where, even more than in the simulation, the learners are (almost) fully in charge of the nitty-gritty content, and that they must do it among themselves, for themselves and with their own expression. That is why I like to run debriefing sessions with participants in small groups working independently and in parallel, and then also to ask them to debrief partially or fully outside class, for homework. On some occasions, sometimes I sit away from a debriefing group and listen in discretely, and then move to another group; on others, I actually leave the room for a while, something which some students assured me that they had not even noticed as they were so engaged in their small-group debriefing. (See also Sect. 6.6. Place.)

After learner-centred debriefs or out-of-class debriefs, students still have to prepare and deliver a plenary presentation on their simulation+debriefing work. It is during such presentations that other students (groups) and I are able to comment, correct and criticize. This is illustrated in Fig. 6.5 (in the section on *Whither*) and discussed in more depth later, under *How*. The fact that my students know that the debriefing belongs to them may be behind their clear eagerness to debrief. Detailed discussions of learner-centred debriefing are offered by Cheng et al. (2016), and Kikkawa et al. (2021) provide useful insight into facilitator-guided and self-guided debriefing.

Thus, ownership really matters. The debriefer's stance on or approach to debriefing ownership will determine several aspects of debriefing. This is an important dimension of debriefing that you need to decide at the outset, in the

design stage, because that is there where you will design your debriefing format and materials. It also impacts simple, but important things like room layout, time given to debriefing, place and organization of debriefing. Some of these things are discussed in the other sections here. Further discussion on ownership is to be found in: (a) 'Trust and ownership' (in section 6.11.4 Factors) and (b) 'In-class presentation' (in Table 6.8).

6.9 Who/Whom—People

The number of different roles involved in debriefing is surprisingly large. It is worth reviewing these briefly. You will notice that each of the people concerned plays a variety of roles and occupies a variety of functions.

- **Participants** are, of course, central. They may step into a variety of shoes over the time period concerned by a given debriefing. First, they are ordinary people with a host of pastimes, responsibilities and roles in their lives. Second, they walk into a training centre, school or university and become learners. Third, they start their simulation journey, the blue arrow in Fig. 6.4, and learn to take on some kind of more or less well-defined simulation role, given by the simulation rules or scenario. Fourth, they continue as a learner on their blue-arrow (debriefing) journey towards outside reality (their learning goal). Fifth, they need to become ordinary people again. During this journey, they may also have worn one or more other hats, such as observer, debriefer, discussant, listener, coach, note-taker and presenter.
- **Observers** are extremely useful, on at least two levels. The first time that I meet a group (e.g., a class) who has had little or no experience of simulation, I spend quite a bit of time explaining in a mini-lecture what it is, including an explanation of why debriefing is important, and showing Kolb's learning cycle. Then I ask for volunteers to participate in the simulation. Sometimes several members are hesitant and prefer not to play. I tell them that it is perfectly OK to decline to play, but that I would appreciate them being observers. I ask for a few things (two or three per person) that they would like to observe, and ask then to make notes during play. The second time that we play, everyone wants to participate; almost no one wants to observe. However, I explain that observers are important to provide feedback during debriefing, that they can really help their peers to learn from their observations and therefore that everyone needs to take their turn to observe and provide feedback—and thus everyone contributes to the learning of everyone else. This is of course easier in a course with a simulation every week. Some of the instruments in the Appendix contain notes for observers or forms with the role of observer.

- **Facilitators** too may take on a variety of roles. These depend on their past experience, their approach or philosophy of learning, social and intuitional expectations, and so on. Roles may include simulation facilitator, debriefing facilitator (debriefer), simulation participant (e.g., taking on a role briefly for demonstration purposes), observer, listener, teacher, trainer, encourager, evaluator, grade giver and others. Less centrally involved people might include game designers, administrators, simulation technicians, conference presenters, trainers, authors and so on.
- **Co-debriefing**. You may wish to debrief with the help of a colleague—or co-debrief. This needs careful preparation, sensitivity to your co-debriefer as well as to participants, flexibility, adaptability and knowing when to be a good listener. It also requires a high level of trust and respect between you and your co-debriefer. I have enjoyed the few sessions in which I co-debriefed, and I learned much in the process. I remember one session with Sandy Fowler, with whom it was always such a delight to work; it was a pre-conference workshop in which we were training cross-cultural trainers, and I know that I could not have done it without Sandy. Another enriching experience was with my friend Alain Percivalle, when we ran a session on debriefing for medical personnel, at the Faculty of Medicine, University Côte d'Azur. As we had differing approaches to debriefing, we took advantage of this to illustrate to trainees that no one single way exists to debrief and to give them a broader repertoire of techniques. With three friends, Beth Tipton, Elyssebeth Leigh and Willy Kriz, at the 2015 ISAGA conference (Kyoto, Japan) we jointly ran a five-hour workshop on debriefing. I learned much from my co-facilitators. See Tipton et al. (2016). One advantage of co-debriefing is that you can debrief yourselves after the debriefing session with participants. You will find more discussion and useful advice in Cheng et al. (2015) and Goldsworthy et al. (2022).

6.10 Which/Whether—Choice of Structure

Several types of debriefing structures (or formats) have been developed over the years.

- Early structures, mentioned in Thiagarajan (1992), for debriefing include these phases suggested by Gaw (1979): Experiencing; Sharing; Interpreting; Generalizing; Applying; Processing.
- Ruben and Lederman (1982) suggest questions related to: Validity; Reliability; Utility.
- Morry van Ments (1999), a pillar for the British Association SAGSET, used: Establishing the facts; Analysing the causes of behaviour; Planning action.

- Thiagarajan (1995) suggested six phases: How do you feel? What happened? What did you learn? How does this relate to the real world? What if? What next? This was based on an earlier plan of seven steps.

Other types of debriefing, such as CISD, PTSD or security incident fact debrief, use different steps or phases.

Much writing on debriefing offers a structure of some kind. In recent years, medical simulation experts have developed a number of formats or structures. Figure 6.11 outlines a number of medical simulation training debriefing structures, showing their similarities. Indeed, many seemingly different ways of debriefing have much in common, which is hardly surprising, given that they all share a common overall purpose. It is probably their underlying similarity that is of most interest, rather than the more superficial differences. Other structures and formats exist, and you will discover them in other writings on debriefing.

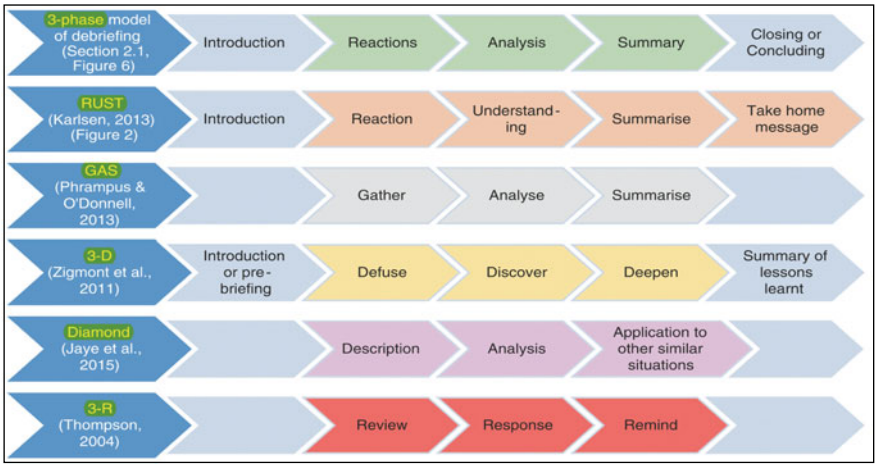


Fig. 6.11 Similarities among a number of debriefing structures (from Oriot & Alinier, 2018)

A major choice that you will have to make is to opt either for a facilitator-focused debrief or for a participant-centred debrief, as discussed in *Whose* above. This choice is more or less independent of the structure that you use. You can also, of course, choose to start the debrief in participant-centred mode, and end as teacher-focused; I would, in most cases, do it in that order. An interesting way to approach debriefing is outlined in Zhang et al. (2018). For a useful overview of debriefing, see Sawyer et al. (2016), Oriot and Alinier (2018) and Secheresse et al. (2021).

6.11 How—Way/Manner

No doubt, a hundred or so ways to debrief have been invented and used. One thing for sure is that no one single way of debriefing is the best. However, one could argue that debriefing really starts with the briefing (introducing and setting up the game session).

6.11.1 Briefing

Before the simulation or series of simulations, I usually tell future participants about simulation in general and about the particular simulation in which they will participate. I do this either by ad-libbing or with a slide presentation. I usually go over some of the main aspects of simulation, its purposes and advantages, its difficulties and demands, especially on participants (such as the need for full participation and for responsible and respectful behaviour) and the imperative of debriefing. I usually show Kolb's Experiential Learning Cycle diagram, and explain how simulation and debriefing mesh with his ideas. Students understand and can relate to that fairly easily, especially as they recognize it as being different from their usual class fare and in line with professional matters. When they come to their first participation in a simulation, it is then not completely disorienting.

I explain in a nutshell that the debrief after the game helps people to process their experience, especially if it has been stressful or emotional, so that they gain insight and learning, and can then move on to manage their life in a more effective manner. The mention of stress and emotion usually catches their attention as it is rarely talked about within the hallowed walls of a university. I reassure them by saying that emotion in a university is taboo, but that expressing and talking about emotion makes them more human, and that it can lead to a liberating effect. I tell them that the debrief is the most important part of the whole exercise. Most students seem to understand the basics with relative ease, which is less the case with a group of teachers. Students take to games more readily than some teachers, even teachers who use games!

In addition to aspects of simulation in general, it is important to tell participants some specifics about the upcoming simulation, such as the learning goals, the game objectives (end-game criteria), the rules, the scoring system, the role of the observers, the importance of the debriefing. I stop and ask if they have questions; I ask if anyone wants to observe instead of participate. I put people in groups or ask them to find their own groups, sometimes with specific criteria (such as group size, gender balance, cultural balance).

In some cases, I ask students to take part in a short and light-hearted *briefing simulation*, designed to prepare them for the upcoming larger and more engaging simulations. A briefing simulation is not designed to teach any content, but it provides a first, hands-on experience of the simulation cycle, of participation and of debriefing. Participants familiarize themselves with fundamental aspects of

simulation and they are able to taste 'life in a simulation' without the pressure of also having to learn something. This usually has a positive effect on the subsequent simulations. It takes the idea of simulation out of the dark unknown, and places it into known practice. It is what I call "learning to be" in a simulation. In addition, a number of factors will influence how you run your debriefing.

6.11.2 Ownership

I return here to the notion of ownership. Your stance on this will, in my view, have a profound impact on how the debrief goes, what the participants get out of it in terms of learning, self-fulfilment or well-being and satisfaction. As I discussed above, a stance in which a debrief is in fact accomplished with the teacher claiming their self-ordained right to control proceedings is not, in my view, going to allow the learners to accomplish their learning goals very effectively. Under these circumstances, I would suggest that teachers either have to admit defeat and accept that learning was minimal or have to be economical in their claims to learning.

Ownership is a question of adopting the right mindset. I have rarely felt comfortable adopting a stance of "I will now debrief you" and "this is what you have or should have learned". I, therefore, push myself to adopt a mindset of relinquishing control over most of the debriefing. What I do retain is guidance over procedural matters, and even then, if participants say they wish to pursue or to cut short a debrief I do my best to take that into account, for example, by prolonging a debrief to the following class or letting the students leave class early.

6.11.3 Time

Debriefing needs time.

> Effective debriefing also requires time. This time has to be included in the planning of any experience-based programme. Too often it is the debriefing phase of a programme [that] is cancelled or considerably shortened … (Pearson & Smith, 1985)

On several occasions, I have been asked to shorten a debriefing session, even by gamers who supposedly know that debriefing needs time. In most cases, debriefing time is incompressible. Lack of time is probably one of your major obstacles in facilitating and game and debriefing it. This, of course, raises ethical issues in relation to your participants. Is it better to do a rushed, superficial debrief, and leave participants frustrated and taking away the wrong message, or simply to refuse to run the simulation? That is a judgement call that you may find that you have to make in each case that you are restricted in time. Remember too that if you go ahead (motivated by your own eagerness or under pressure from a workshop or conference organizer), the likely fallout on you from an inadequate debrief is that you will be seen as or felt to be a poor facilitator. In addition, an inadequate debrief tends to bring the simulation/gaming profession into disrepute.

In regard to amount of time, opinions and practices differ. They seem to vary from at least half the duration of the game to twice the length of the simulation. It is impossible to give a more precise estimate here. Each event is unique and will require a minimal length of time to debrief. A 3-month internship will not require 3 months to debrief; a 10-minute game may need half an hour to debrief. Remember the adage that a game is ideally a means of providing substance to debrief.

6.11.4 Factors

A wide range of factors may influence the way you debrief, in general or in any particular instance. It is probably wise to focus on just a few factors during any given debrief session, and let the others "take care of themselves". Possible factors include:

Learning goals. If the learning goals of your participants are behavioural or performative, such as job-interview skills, then you may wish to run several short debriefs during a sequence of simulations, each one building on the previous (as in Sect. 6.5.3 above). Examples are included in the appendix. If the learning goals include understanding complex systems, such as the relationship between natural resource management and the human tendency towards greed and overshoot, then you may wish to include an occasional taking stock feedback during the game, and then a series of longer debriefing activities after (as in Sect. 6.5.2 above). Examples are included in the appendix. If the learning goal is for participants to get to know each other (warm-up exercise), then an informal chat at the end may be sufficient.

The learning goals need to be established and the debriefing protocol and materials need to be designed and built as part of the overall game design, not something tacked on as an afterthought. The learning goals need to be reflected clearly in the debriefing protocol and materials. Thus, they cannot be scrambled as the simulation nears the end.

Prior simulation experience and reluctant participants. It always strikes me as somewhat odd that some people do not like to participate in simulation, which usually happens when they are confronted with such an activity for the first time. So, it behoves me to remember an early article by my dear friend, Danny Saunders, entitled *Reluctant participants in role play situations: Stage fright or bewilderment?* (Saunders, 1985) and which is still highly relevant today.

My approach to this fairly common reluctance is simply to accept that some people are reluctant, nervous or even fearful about participating for the first time in a simulation. This tends to happen in a new class of students, most of whom are somewhat befuddled by being asked to become active participants, instead of sinking into a half-snooze for a lecture. Once reluctant participants can see that I understand their reluctance, they immediately feel relieved. What I do is to accept that they do not participate, but I ask them two important things: one is to be observers and make notes on what they see, which most are happy to do; the other is to stay silent and not interfere with the simulation participants. Almost invariably,

the next time I run a simulation, everyone wants to participate, and then it becomes a problem of getting volunteers to observe. If students are working in small groups and taking part in several games, I ask each group to decide who is observer for the upcoming game. When we come to the next game, they will already have decided who is to be the observer.

Observers–debriefers. In almost all short or medium-length simulations that I run, I arrange to have some participants observe the simulation as it unfolds. Thus, you may also surely wish to have one or more observers for each game group, each one observing a certain type of behaviour (e.g., gestures or eye contact). As a general pattern, I give observers a *Guide for Observers* (see copy in the Appendix). While the participants are studying their game materials, I meet with the group of observers and go over the main principles in the guide. Some people understand by reading, others do better from hearing it. On several occasions, I have congratulated a student for doing some outstanding observation, far better than I would be able to do. They usually tell me that they like that kind of observation task or that they have done it before. If you wish to develop a more complete observation protocol, Hassenforder et al. (2020) will provide some excellent material.

At the end of the observation period (end of the simulation), each observer becomes a debriefer. The *Guide for Debriefers* is longer than for observers (see copy in the Appendix). I go over the main points orally, and then leave it to each debriefer to manage the debriefing proceedings. Over the course of several debriefing sessions, either as debriefer or as participant being debriefed, participants learn how to manage the meetings. This is a skill that they have told me is useful in itself.

In my debriefer training sessions, I usually have two observers. One person does the observation as above, and the other will then observe the debriefing session, and share their observations in a meeting to debrief the debriefing session.

Affective reluctance, or reluctant affect. Many debrief formats start with emotions (see the section Which/whether and the various debriefing forms in the Appendix). As you can imagine, some participants, usually males more than females, may be nervous or fearful of talking about their emotions. Indeed, some participants may even be reluctant to admit that they experienced a range of emotions. It may also be that in their first debrief session, it is the first time that they have been invited, let alone expected, to talk about emotions, especially in universities where such stuff is considered inappropriate or even taboo. Emotions, then, do not necessarily come trippingly off the tongue.

The conventional wisdom is that, at the start of their debriefing, participants should address their in-game emotions. The rationale is that people need to deal with, come to terms with, calm down, understand, express, share and articulate their game emotions before they are (fully) able to think about, share and learn from the cognitive and behavioural aspects of their participation, and (fully) able to understand the system complexities of which they were a part, and to which they contributed, during the game.

Even with the use of debriefing forms (see examples in the Appendix) that include an explicit question on emotions, some participants will avoid mentioning their emotions. Sometimes, the space for answers to emotional questions carries few words, is even left empty, or mentions something else, such as another participant's behaviour. As I walk round the participants working in silence and filling out their form, I will stop at those who have failed to provide a few emotional words. I explain briefly what is wanted—"during the game did you feel relaxed, excited, angry, annoyed, happy?"—and point to the words on the form. I reassure them that telling about their feelings is okay and is in fact good, that everyone had feelings and that even I had feelings.

After filling in their individual debriefing forms, participants meet in small groups and go through the questions. Here again, some people (males usually more than females) avoid talking about emotions. When I see this, I go up to the group and again explain to the whole group that emotions are good to talk about, even if I know that my comments are aimed more at the male participants. As I explain, sometimes, from behind, I put my hand on the shoulders of a particularly nervous male, and this is reassuring for him. Once they have dipped their toe in the water, suddenly, they seem relaxed and are able to express their emotions.

When I sense that groups have got over their initial inertia and got under way, I am able to draw up a chair at a little distant and to listen in to each group without disturbing them. Usually, they hardly notice me, but if I sense that they feel my presence (too strongly), I get up and move to another group. I can even be near one group, but actually listen to another group. During small-group, online debriefings (several groups working in parallel in different online rooms), it is perfectly possible to drop in on a group, but without my webcam on and without intervening. Of course, I explain beforehand that I will drop in out of interest, but that it is their debriefing session.

Trust and ownership. Facilitators who are still driven to conduct teacher-centred debriefs and to correct every small error almost before it is made may find reassurance in several emerging qualities of debriefer groups. These are debriefer groups' internal resources, such as honesty and trust, debriefers' natural desire to own their learning, and debriefer groups' abilities to self-organize and to self-determine. An independent, teacher-free debrief group quickly develops trust, ownership, a self-determined attitude and a self-critical approach among its members. Debrief group members, free of the spying eye of a threatening teacher, can be and often are both more critical and more supportive of each other than a teacher could ever be. In addition, peer criticism is often more relevant and effective than that proffered by a teacher. I have sometimes been alarmed by the directness and harshness of some debrief members towards their peers, but immediately relieved and glad to see that the remarks are well received and taken on board. Trust for honest feedback and open expression is crucial in any debrief, and this can, in my view, only be fully achieved in learner-centred debriefs, with the teacher mostly out of the way. An example from my own experience is provided in Box 12.

Box 12. Episode of honest feedback and the development of trust

I remember clearly several instances of harsh and direct peer remarks during debriefing. One episode stands out for me. This was during the debrief of a job-interview simulation, one of several during a whole semester course on job interviews based on a backbone of several interlocking simulations, with several debriefs for each simulation. Indeed, for each 10 min simulation, about one hour was spent debriefing, with feedback provided mostly by students themselves. During one debrief of a student's job interview, one of the student debriefers said in a fairly strong, but respectful voice:

> Your eye contact was good, and your gestures were ok, but your arrogance is your downfall. If you do that in a real job interview, you will just not be selected, and they could even remember you later. You come across as far too arrogant, and that is a no no for a job interview. In real life, you also tend to be arrogant, we all [students in the class] can see that. So, for a job interview, you really have to cut your arrogance. In real life, you can make a start, and that would be nice for us.

At first, I was a bit taken aback, but a quick glance at the student debriefee reassured me that he [it was a male] was listening carefully. After a pause, the debriefee said to the debriefer student "thank you for that; it is a great help". I am not sure I would have dared to be so forthright, and even if I had, it would probably not have been driven home with the same force. In subsequent debriefs, I actually took my cue from that and was more direct in my own feedback, but usually giving a cue for the students to rebut if they felt like it. It is important for students to know that they can object to what I say in regard to feedback that I gave. Sometimes they did, but then other debriefers would sometimes insist that the debriefee listen to what I had to say. I usually emphasized and reinforced what other students had said, but I would also give feedback on things that had not been brought up by students. In any case, when offering feedback, I usually ask the student what they think; was I being unfair or did it make sense? During the early debriefs, a climate of trust would develop, and it generally remained throughout the remainder of the semester.

Completely handing ownership of debriefing over to participants in no way contradicts the tenets or practice of the Good-Judgement Debriefing Technique, see Oriot and Alinier (2018) for an excellent discussion and further references. However, it does mean that the facilitator (or instructor) must wait until after the participant-owned group debriefing, rather than judging during their debrief. Remember, stay out of the way of the student's own learning! Facilitator or instructor comment (or feedback or corrections) can, and should, be provided of course. However, this can easily, and must, be accomplished during the 'In-class presentation' (see Table 6.8), during which you will need to take careful notes. Indeed, it is likely to have even greater learning effect there as participants may have struggled, during their group debriefing, with some important points, and thus be more open to instructor input. This is what I did routinely, and it worked well.

Participants. The debriefing protocol and materials need, of course, to be adapted to the participants. For example, younger participants will do better if the materials are simpler. Instead of open-ended questions, multiple choice or Likert scales may make it easier to respond. Participants with no or little experience of this sort of activity probably need to be trained, such as in a debriefing simulation (see above). Participants with prior simulation and small-group, learner-centred experience take

to debriefing like ducks to water. Several times, I was particularly pleased to hear some participants at the end of a game say "ok, now, let's go an debrief", and they seemed more focused and excited during debriefs than during the games—this is how it should be.

Culture. The cultural context in which you run a simulation will be a factor that influences decisions that you make (Box 14). In some cultures, for example, women and men are not allowed to touch each other or touch each other on the head. In some cultures, you need to plan for prayer breaks at specific times, or for more or less mandatory coffee breaks. In some places, organizers will tell you that the workshop starts at 09h and ends at 19h, but on your first day, participants are still drifting in close to 10h.

Just as you are trying to make up for lost time, at about 16h, participants announce that many have to leave as it takes them two or more hours to get home. When you query this, you are told quite naturally that official and real times tend to be rather different. Better to adapt to that fast, otherwise you may experience unneeded frustration.

Resistance by others to debriefing. Also, you have to find your own way of overcoming resistance to debriefing in all sorts of people who think that they know better (just like many people think that they know about language or about climate change), but who in fact have not taken the trouble to find out or to experience for themselves. When your debriefings are relatively successful, and participants thank you for encouraging, even pushing, them through, then you can have full confidence in insisting that you are given the time that you need in order to debrief properly. Do not be browbeaten or cajoled into accepting less time than you need. If necessary, explain that you refuse to run a simulation and have it fail because you have not been able to debrief properly. In the end, you will be respected for standing your ground on important principles. Also, if, in the end, you are given the time, and the debrief is successful, which it is likely to be, you will have no further need to fight that organization. Those are things that you have to negotiate well before you agree to run a workshop. You can also agree to do a short version with a warning that you cannot guarantee results. Box 13 gives some insight into one way of working things through when your host is a reluctant player. It is not just participants who may be reluctant at the start, it is sometimes organizations (e.g., schools or conferences), even those doing games.

Box 13. Negotiating a safe debriefing time and space

I was once asked to debrief a whole conference, on games no less, but the organizers did not feel comfortable giving me the necessary time, so I suggested a greatly reduced time frame, with a severely cut-down version of the debrief and with uncertain results. The session turned out to be fairly successful, sufficiently so that in a subsequent conference (again on games and organized by the same people) I was given the required time and space to do a full conference debrief. This was a great success and lead to several invitations to debrief events elsewhere.

6.11.5 Steps

Below is a table that spells out in some detail the kinds of things that you might consider adopting in your debrief sessions. They are only my own way of doing things, but developed over several years. The table contains only a gist of the things that I do. In any case, you must develop your own materials, procedures and sensibilities, taking what you find useful, leaving things you do not like and inventing your own (Table 6.8).

Once you have mastered something of those steps, then you could probably think of yourself as a good or even as an accomplished debriefer, but it takes time, as it did for me. Even now, after many years, with almost every debrief, I discover new things and realize that I could have done better.

Table 6.8 Steps in debriefing

Step	Notes, often based on my own practice
Pause and de-roling	It is usually a good idea to have some kind of pause between the point where you stop the simulation and the moment when you start a debriefing session, be this during or at the end of a simulation. Some people say that the debrief should be almost immediately after, but my experience is that a reasonable pause, anything between 10 min and an hour, gives participants the chance to de-role, that is to 'cool down', to take some deep breaths and do whatever helps them to recover their normal composure, after what could have been a tumultuous session, or at least a game involving tension, if only from high and sustained concentration. If circumstances allow (time and space), it is a good idea to ask participants to leave the simulation room and go for a short stroll outside in the fresh air, and then to return after 10 or 15 min. This also gives you, debriefer, a breather and time to organize furniture and materials for the impending debrief. Participants should also take off any role badges that they might have had, and shed any other paraphernalia that was part of their role. The longer the simulation and the stronger the emotions, the longer the pause. Sometimes the pause can or must be a full week, for example, if timetabling does not allow game and debrief in the same sitting. You need not worry about participants 'forgetting'. Research shows that games are more memorable than ordinary (boring) classes. Participants are highly likely to remember, and once the debrief gets under way, their memory will be jogged and details will come back fairly fast. If you use an end-of-game or midway game questionnaire, then they will already be starting their debrief. If you pause for a week, then participants will need to remember to bring their form to the debrief session. In contrast to what I know of ordinary classes, my experience in simulation sessions is that they invariably remember to bring their forms because they are keen to do the debrief, knowing that they will learn. It is usually okay to let participants talk about the game during their pause; some will, others do not. If you join them in the pause, they may ask you questions and make comments. My stance here has been to listen carefully, to show interest, to agree with comments like "that was not easy" and, for involved questions, to suggest that they should bring up the issue during the upcoming debriefing. I have sometimes had a question like "is it okay to talk about X in the

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	debriefing?", to which I answer "you do not need permission from me, you can talk about anything, as long as it is respectful". For some types of game and debrief, you may wish to impose a talk embargo until the start of the debrief, but you should explain to participants why you are asking them to keep mum for a while, when their strong and immediate urge is to talk.
Intro	Welcome back participants into the 'debriefing room'. Remind them of what you said in the briefing at the start. Elaborate a little; point out some important aspects of debriefing, especially that it is the most important part of the game session and that it is in the debrief that the most significant learning happens. One main aspect of this introduction is to set the scene, as it were, and to making for a safe and comfortable environment so that participants will feel that they can trust others in their group and that they can express themselves freely, without fear of retribution. Of course, the debriefing guide and the debriefer will help considerably to set a positive scene.
Guide	If this is their first time in a debrief, then it is important to emphasize certain rules regarding behaviour. You will find an example *Guide* in the Appendix. The guide is also an instrument that observers who are about to become debriefers should already have studied. If they have already used this instrument, your intro can be shorter.
Groups	Ask people to sit in groups as you have determined, or as they wish. The group membership for debriefing can be different from that during the game, or it can be the same. If I wish participants to discover experiences from other groups, then mixed debriefing groups help. This works well, for example, with *Fishbanks* (assuming, of course, that each fisher was a group of participants). If I wish the game group to focus on its game performance, then participants stay in the same group. This works well, for example, with the teamwork game *Towers*. It is also possible to run two debrief sessions, with debrief group membership changing in the second session. This works with most games, including *Fishbanks* and *Towers*. I have also started with game groups debriefing within their group, followed by a (shorter) debrief where members from each group are placed together.
Individual debrief form	The first step in most of my debriefing sessions is done individually and in silence. That tends to surprise some teachers, and they immediately question it. Interestingly, I have never had a participant question this. As a general rule, you should do what you think would best benefit participants. Imagine yourself as a participant and ask what would be good for me just now. Participants are not left alone to their own devices as they have the individual debrief form to fill out and they know that they will meet with their peers later. Filling out the form keeps them busy; generally, participants appear to be very concentrated during this time. Some participants write long replies, despite being asked to give short ones. In a way, this is excellent, but it does mean that you have to juggle with coordinating the timing (see below). The advantages of an initial individual debrief form are many, and include: • The silence gives participants time to think back over the game (some of my forms specifically ask participants to think back over their game experience); • They start their debriefing calmly, and are actually able to do what many say that debriefing should be, a time for reflecting back on experience, which is far more difficult during the hurly-burly of group discussion;

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	• The silence gives participants time to collect their thoughts and to articulate answers, which would be difficult or impossible during a purely oral debrief, where they have to listen carefully to and think about other people's talk, in addition to expressing their own ideas; • The form contains spaces allowing participants to articulate their thoughts in writing, which requires that they think more carefully than they would if ad-libbing in reply to a rushed oral question; • Each question on the form helps the participant to focus on a specific aspect of their simulation participation, instead of wandering about; • Putting thoughts in writing forces participants to be more precise; • The writing gives participants the chance to make notes on their initial thoughts, enabling them to be freer during the oral discussion later; • The notes serve as reminders to bring up certain things during the subsequent oral debrief; • The writing constitutes a record that students keep. They use this when they do one of their last debrief activities, which is a portfolio for the whole course. Several examples of forms are to be found in the Appendix. The only real problem that I have encountered with using forms is that people fill them in at different speeds. Here are a few tips to reduce the disparity: • Announce the end time, e.g., "please complete your form in 20 min, no more"; • Half way through, announce the amount of time left; • Five and two minutes before the end, announce these times to finish; • Allow a short time after for laggards to finish; • Walk around the room, keeping an eye on how far people have progressed; • Adjust the finish time as a consequence, e.g., if most people are ahead of schedule, announce a shorter time to finish; if several people are lagging behind, announce a slightly longer time; • For those who finish very early, you can ask them to be patient for a short while and maybe to go back over their form to see if they have other things that they would like to add. Remember that your form must be designed during the simulation-design phase, and not left until a few minutes before your run the simulation. The form will include some (or all) of the learning goals that you have set for the simulation and debriefing. Thus, you have to strike a balance along several factors: the learning goals, the types of issues involved, the level of emotional charge that is likely to be generated during the simulation, the types of participants (e.g., adult, sophisticated, middle school people, minorities). As a general rule, your form will be on paper handouts. However, if your simulation is online, then you can easily build a form with online tools. The one that I use is Google Forms. One advantage of online forms is that you can collect the data for research after. If you use online forms, it is important to tell participants how the data will be used—see the Appendix for an example.
Meeting with observer–debriefers	During the above silent time, gather with the simulation observers. Go over the main points for observation. You may ask them to use blank paper or give them a form that focuses their observations on certain aspects that are important for the learning goals. Such forms should be easy and straightforward to fill out. Ask if they have any questions. Explain that, when the debriefing starts, they will become debriefers and chair the debrief meeting. If this is the first time for them, they may be a little anxious,

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	but understanding and reassurance from you will be of great help. Go through the points in the Debriefer Guide (see example in the Appendix). Ask if they have any questions. Emphasize that their role is essentially to help the group share their game experience and express their ideas. Their role is more to encourage others to talk, rather than talk themselves. However, their feedback to others from their observation is very important, and they should not shy away of sharing their observations at appropriate moments.
Questions	At each step of the way, I try to remember to ask if anyone has a question. I usually pause for a few seconds, as people may need time to call up a question that they had or a new one that starts to form.
Group debrief form	In most cases, I also develop and distribute a group debrief form. This resembles closely the individual form (see example in the Appendix). It follows the same pattern, either with the original questions in full or with just summaries. Several ways of using this include: • The participant debriefer in each group makes a few notes to capture the essence of the discussion for each question; • Every participant has a form and makes their own notes as discussion proceeds; • If you have had two observers, then one can become debriefer and the other become discussion note-taker for the group.
Start of the debrief	Remember that the type of episode that I am talking about here is learner-centred or participant-focused debriefing. This allows small, independent groups to discuss together without the teacher controlling the talk and telling participants what they should have learned or even that they did something wrong. The term *debriefer* here refers to the participant as debriefer. The teacher's role is to coordinate the proceedings, to help out with ambiguities, to reassure, to nudge an individual or group back on track if they seem to have drifted, to set time limits and so on. At the start, I usually go over a few of the main guidelines for debriefing (see Guide in the Appendix). I emphasize the ones that seem particularly important for the groups. I mention that if they wish to know more, they can ask the debriefer to show them a copy. I remind participants that debriefing is important, that it is the chief place where learning happens and, crucially, that each person is responsible for their own behaviour and their own learning. "The learning that you derive from this debriefing depends largely on you, on your participation and input, on your sharing, on your listening to others respectfully, on your considering others' views, even if you do not initially agree with them. You form a learning collective, wherein each person is responsible both to themselves and to the collective. It is by working together that you will make the most of the debriefing session and derive the most valuable learning." I explain that the people who were observers during the simulation have now become debriefers and that it is they who will chair the discussion. I tell participants something like the following: "During discussions, you have important things to share with others, and that helps you to learn. However, you can also learn from listening to others, who also have important things to share about their experience. One person, whom you may have not noticed much was the observer. This person was outside the bustle and rumpus of the simulation, quietly taking notes about what was going on. The observer

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	could, thus, see things that you did not see and even that you would not even imagine seeing. The observer can tell you a lot to help you learn. So you also need to listen to the observer." Even if you emphasized in the observer–debriefer meeting (see above) that the debriefer must get the others to talk, you will occasionally encounter a novice debriefer who starts and continues the debrief by doing most of the talking. If I see a debriefer talking too much, I intervene, and do it as early as possible. I may address the whole group in this way: "Now, normally, your debriefer chair is there to get you to talk, so if you do not talk, the debriefer may get nervous. And what happens when you get nervous? Yes, you talk, often too much. So help your debriefer to help you by talking. And, debriefer, please give the others a chance to talk. Sometimes, they may need a short while (5–10 s maybe) to think what they wish to say. So be patient. Silence is perfectly ok; it usually means that people are thinking. Be comfortable with others in your group when they are silent for a while. Remember that listening is the greatest of all communication skills."
Give time limit	Just before the debrief starts, I announce the time by which they should have reached the last question on the form. If a group has already debriefed (in a previous session), it is perfectly possible for them to start the debrief in class and to finish outside of class. Thus, groups can end their debrief session at different times.
Debrief proper	The debrief proper is usually a quiet time for the facilitator. You can do several things during the debrief. Often the debriefing groups do not notice the facilitator. When groups seem to have settled into concentrated and respectful conversations, I sometimes leave the classroom physically as a signal that the groups are on their own and that I am not interfering. When I return, I usually have the impression that some groups at least are not aware that I have returned, and that is a good sign for me. However, it is still important to keep your eyes and ears open to what the various groups are doing. Eyes pick up on body language, and ears tell you the tone of the conversations. I sometimes walk around to get an idea of how groups are proceeding. Some groups will advance faster than others. It is good to remind groups of time limits. Here I do not shout out to the whole gathering; experience has told me that some do not listen as they are too immersed in their discussion. A better tactic is to go to each debriefer, the person coordinating each group. Either speak quietly in their ear with "10 more minutes" or write a time on a card and show it to the debriefer. Of course, some people learn more quickly how to be a debriefing chair of a discussion. At first, some participants are nervous about taking on the role of debriefer. After the second or third simulation, most participants want to try their hand at it. As far as possible, it is best to ask them to volunteer, but sometimes you have to put pressure on someone. Generally, after they have done it, they express satisfaction at having had the experience. Thus, a simulation debrief also helps participants to learn additional skills such as chairing a meeting, balancing questions, note-taking and showing leadership.

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Table 6.8 (continued)

Step	Notes, often based on my own practice
End & next	At the end, it is usually a good idea to thank people for their hard work. Generally, they tell me, the debrief requires harder concentration and is more tiring than the simulation. I ask individuals and groups to keep their debriefing forms and notes carefully as they will be needed later.
Outside class (homework)	Most participants that I have had learn quickly how to manage their own debriefing discussions. A tell-tale sign of this can occur even at the end of their second simulation, when some will spontaneously say "ok, let us now go and debrief", and they ask for the debriefing form. Once groups have learned to manage their own debriefing discussions, it is time to let them fly on their own wings. I ask them if they feel OK about finishing a debrief or doing a whole debrief together outside of class, during the upcoming week. Most say yes. Some may indicate being unsure, to which I usually suggest that they try and they will probably do much better than they think. It is important to ask participants to finish or do their debriefs out of class only when you are fairly sure that they will be able to do it fairly well. Most participants are up to the task after completing a whole debrief in class, and maybe starting a second. Of course, much depends on the participants' level. Most of mine were first- or second-year masters level students, and they appreciate the challenge of doing this as well as the trust that you put in them to act in a responsible manner. University students' maturity and self-efficacy in studying vary across cultures. You will have to gauge your own students' self-debriefing ability. As a general rule of thumb, you should assume that they are more capable than your initial inclination might tell you. Give them the encouragement to try. In almost all cases, they will rise to the challenge and succeed. The desire to succeed is strong, especially when students work in a group. Once they have demonstrated to themselves that they are capable of conducting their own debriefing without your immediate presence, they will do it well and gain both satisfaction and learning from it.
In-class presentation	In addition to finishing or doing their debriefing outside class, my students are required to prepare a presentation for the next class, based on their debriefing. (These notes are based on my teamwork skills course, and they can be adapted to many courses that use a series of simulations and debriefs.) At this point, I have stopped calling them 'groups' and call them 'teams', which they like (even if they have not yet met fully the criteria for being a fully-operational team). As a general pattern, I ask them to prepare a ten-to-fifteen-minute presentation, and leave five to ten minutes for questions, with a structure as follows: a. **Introduction** (name of their team, team members, class ID, etc.). In many simulation sequences, I ask teams to make a name. They have been pretty inventive. b. **Description** of the simulation and what happened. c. **Results** of the simulation, showing photos that they took during the simulation, graphs based on the evaluations (which I email to them after I have done the calculations). d. **Analysis** of the results, such as why they think that they achieved this or failed that. The analysis has to be concrete, and draw on the notes during the debriefing and, if they feel able, mentioning members by name. If they disagree on the analysis, they should mention this, saying what the disagreement is and why. Generally, they have been fairly self-critical.

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	e. **Readings**. Each team has to have read some documents about concrete aspects of teamwork and relate their results and analysis to the principles in those readings. f. **Improvement**. Each team has to specify in concrete terms what improvements each of its members undertake to make for the future (either in the next simulation or in reality). g. **Questions** and comments from other students, and finally from me. This is where I get to make comments on their work, cross Ts and point out strengths as well as weaknesses in their work. Generally, their presentation is a high point for students as they are keen to tell about their experience to everyone and tell about their things for improvement and their success. In the first time round, they tend to go well beyond the time limit, but (sitting at the back of the room) I hand signal that they need to get a move on. In my comments, I point out to each team that a good team sticks to the allocated time (usually with a story about presenting a project to a funder). The students sometimes complain that they need more time to say everything. I reply that it is good that they have so much to share, but that they should also hone their skills in summarizing the main points. I then ask how much time they need for the next presentation, and we tend to negotiate something like 15 or 20 minutes, plus 10 or 15 for questions. Of course, I then warn them that I will cut them off if they go over the allocated time. They generally do not; one more team skill learned.
More games and debriefs	In some courses, a debrief session is followed, in the next class, by another simulation. It is generally focused on a related or extended skill set and/or is more challenging. For example, instead of building a tower, they have to build a bridge. By this time, students are able to conduct their debriefing fully outside class. Some have told me that their discussion has even gone on for over two hours, that they found it exhausting, but rewarding. As time goes on, the team members begin to talk about themselves and behave in terms of real teams, which is what they form over and above the simulation episodes in class.
Portfolios	Of course, during class, it is not possible to give a grade to each student. I explain that in reality they do not need a grade, and that a grade means little or nothing. It is not because they have this or that grade that they can claim to be good team players for a company. The only way is to actually do it, as they did in class. A grade does not guarantee any kind of 'level' in teamwork. I explain to students that, unfortunately, I have to give in a grade at the end of the semester because someone in the university sits at a computer and inputs numbers, which they call grades. However, it is not really possible for me to give an accurate grade. I did not see all their work, either in class or outside. It is only they who know what they did with any degree of accuracy. Therefore, they are the best placed to give a grade. After some questions, doubts and more explanation, they come round to the idea that they can give themselves a grade, and do so more meaningfully than I can. In addition, the portfolio, thus, becomes another debrief for them, a debrief in which they look back over their whole course, begin to realize the progress that they have made, stand back and understand the broad aspects of teamwork and their importance in real life. In addition, as they write their portfolio as a team, they can continue to practice their team skills.

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Table 6.8 (continued)

Step	Notes, often based on my own practice
	What to do? The answer is to ask each team (not individual students) to make a portfolio for their work during the semester. I explain what a portfolio is, which, sadly, few have heard of before. In addition to including all their work, debrief notes, results, photos, presentations and comments about each item, they have to write notes on what makes for good teamwork (relating them to assigned readings), on their experience of collective portfolio writing and on the things that each member promises to do during the next few years. In addition, I give them a final test of their teamwork skills—yes, teamwork learning continues during their final portfolios. I give them instructions that the team (with all members present) must attribute an overall per cent to each of the members, but that they have to establish a hierarchy by giving per cents that show at least a one- or two-point difference between each member. (My portfolio template gives precise instructions.) They also have to include a team account of how this was done. Finally, I convert the team's per cents into a grade for each student, in such a way as to preserve something of the differences that they have calculated. Some students find that procedure difficult, but most appreciate the opportunity to participate in their own grade assessment. The whole process (portfolio and grade procedure) is, thus, also a way for them to debrief.
Anecdote	As an anecdote, it might be worth relaying this story. One student, during her internship after a teamwork course that I ran, had mentioned the course to her company supervisor. The supervisor asked the student if she would like to conduct a training workshop on teamwork for people in the company. The student asked me for advice, and I gave her materials about the simulations and debriefings that she was thinking of using. I emphasized the need to debrief thoroughly. Her workshop was successful; her boss, the participants and she were pleased with the training.

6.11.6 Debrief Skills Development

None of us are born with debriefing skills; they must be learned, sometimes with difficulty. For many years, I found the debriefing episode particularly difficult; I often felt nervous, and I am certain that I did it badly on several occasions. I still find it difficult, but I feel more confident, partly because I made a special effort to focus on that and discover and invent ways to do it better.

> … it is obvious that the skills necessary for effective debriefing are many and complex. They include structuring and organizing skills, group process skills, communication skills, conflict resolution skills and very often skills in counselling. These skills are not innate, but can be developed through formal training and through critical reflection on one's own experience. *Anyone who undertakes debriefing episodes without a basic grasp of these skills, or without immediately available skills support from someone else, is placing himself or herself and other participants at risk*. As with other skills, however, successful experience in using debriefing skills generates confidence. The level of confidence of a group leader is often reflected in his or her debriefing style. (Pearson & Smith, 1985; my emphasis.)

A number of ways are available to help improve your debriefing skills. One exercise that can be helpful is to include a question about participants' thoughts on

their debriefing—a kind of meta-debriefing. You can include such a question in your group debriefing form (see examples in the Appendix), ask it after verbally or include it in portfolio instructions. A minor drawback of including such a step is that it can lengthen the whole process if done at the end of the debrief. It is easier to do in a train-the-trainer workshop than in a university course. In a workshop on debriefing, meta-debriefing should be built into the workshop structure. Co-debriefing is a great way to learn (see elsewhere in the Chapter). Attending workshops on debriefing; running a workshop on debriefing is probably even more instructive! Some of the techniques for debriefing (e.g., video recording) can also be used in debrief skills training. I would like to think that this chapter might also help and also the works cited in the Bibliography.

6.11.7 Research

Much research has been conducted on the effectiveness (or otherwise) of simulation/gaming in general and on specific games in particular (for an overview of early work, see Bredemeier & Greenblat, 1981; Randel et al., 1992; de Caluwe et al., 2008; Hofstede et al., 2010; for more recent reviews, see Ranchhod et al., 2014; Buljac-Samardzic et al., 2020; Hallinger et al., 2020; Kourgiantakis et al., 2020; Luctkar-Flude et al., 2021). Much of that research tends to be somewhat inconclusive in that it does not demonstrate a massive advantage over what one might call "traditional teaching methods". More recently, Dick Teach (2018) took up the challenge in *Why is learning so difficult to measure when "playing" simulations?*

This is hardly surprising as it is like trying to compare sticky toffee pudding and ratatouille. Also, it is unfair because it sets traditional methods as the standard to which other things must be compared and proven before they can be admitted within the sacrosanct halls of teaching. Conservative institutions do not like being threatened with innovation, openness, enthusiasm, play and least of all silly games.

Thus, it is games, not traditional teaching, that must prove themselves. Very few traditional chalk-and-talk methods are ever expected to prove themselves. It is taken for granted that they work. Yes, they do work, to a certain extent, but so do games. We gamers take it for granted that games work, but gamers are still put on the spot and expected somehow to prove that they work, whereas traditional teachers are rarely asked to prove that their classes work. This raises the thorny issue of whether, scientifically speaking, research can ever 'prove' that this or that educational method works or works better or best. All that science can do is to indicate levels of confidence and probabilities of this or that method working to a certain extent, usually hedged with limitations in each piece of research, which in the end leads to a rather patchy picture of what educational research can tell us about the effectiveness of this and that method. In addition, the kinds of skills that game participants learn (e.g., teamwork, collaborative writing, leadership, understanding complexity, intercultural communication) are more elusive and less amenable to classic educational research than the content of standard teacher-controlled classes.

Despite such misgivings, I would like to suggest that research on the effectiveness of games can do better than it has done so far. One powerful way forward is, yes, to include full and proper debriefing in simulation/gaming research programmes. If we accept as axiomatic that (almost) all simulation/games must include substantial and properly-facilitated debriefing for the full learning potential of a game to be realized, then it makes no sense at all to attempt to show that a simulation/game is effective in helping learners reach certain learning goals if proper debriefing has not been built into the simulation and executed in such a way as to maximize learning.

In research articles on the effectiveness of simulation, little attention is paid to debriefing. With few exceptions, such as research conducted by Toshiko Kikkawa, Willy Kriz, Dick Teach and others, the usual fair is to say something like "at the end of the simulation, students were debriefed", with nothing more about how the debriefing was accomplished. In addition, the above phrase "students were debriefed" smacks of a teacher-centred approach, in which the teacher did the debrief ***to*** the students, rather than the participants being allowed to discover, realize and fulfil their own learning, learning that belongs to them. It would show much greater respect, to the simulation/game research community and to the learners who give us their data, if we include debriefing—the place where learning happens—in our research paradigms and procedures. As long as we tuck debriefing away into a small corner, or simply forget about it, rather than holding it as more important for learning even than the game, we are unlikely to be able to show that simulation/gaming/debriefing works and works well. It is probably in the area of medical simulation research that the greatest strides in debriefing research have been made, with initial impetus by Fanning and Gaba's (2007) well-cited article. Game practitioners and researchers should look at this body of research, some of which is listed in the Bibliography. A good place to start is Roungas et al. (2018).

To summarize the *How* of doing research in simulation/gaming/debriefing, we should, nay, must:

- Acknowledge debriefing as the main fount of learning in most simulation/gaming.
- Include properly designed and facilitated debriefing in any research programme.
- Decide on whether the debriefing paradigm is participant-centred or teacher-focused, and account explicitly and fully for this in the research report.
- Give a full account of the debriefing materials and methods in any research report or article, so that the research can be better understood and replicated.
- Build into research instruments questions about the debriefing as a process, thus providing an idea of how the debriefing was experienced by participants.
- Put pressure on journals, especially simulation/gaming journals, to *require* this kind of rigour in effectiveness and related studies.

In addition, it is important to conduct research specifically into debriefing, its effect, comparing a variety of debriefing types (including no debriefing), its effectiveness and so on. Several years ago, in one of my articles (an Appendix in Crookall, 2010a, 2010b), I suggested a research structure that might achieve this. My suggestion has largely been ignored, including by myself. It is time for rigorous research to be conducted into debriefing itself—beyond the medical arena.

Conclusion

The following words (Pearson & Smith, 1985), written nearly 40 years ago, are just as true and powerful today as they were when they were written.

> Debriefing is neither simple nor easy. Effective debriefing relies upon the development of a range of specialized skills. These skills, particularly interpersonal and interventionist skills and the skill of timing, may be developed through deliberate training and are refined through experience; such skills cannot be learnt by reading this or any other chapter. The only way to learn to debrief is by doing it, and by watching others doing it with an attitude of deliberate and critical reflection.
>
> Reflection lies at the core of experience-based learning. Without it, experiences may remain as experiences and the full potential for learning by the participant may not be realized. If debriefing, or some other form of reflective activity, is absent from a programme of experience-based learning, serious questions can be raised concerning that programme's validity and claim to be based on experiential learning. However, ineffective or superficial debriefing may be even worse than no debriefing at all. Effective debriefing depends in part on:
>
> 1. A positive commitment to the importance of debriefing and its central role in experience-based learning.
> 2. The deliberate planning, in any experience-based learning activity, for an adequate opportunity for debriefing to occur.
> 3. A realization that effective debriefing depends upon a high level of facilitatory skill and a determination by those who facilitate debriefing to either possess or develop these skills.
> 4. The establishment of clear intentions, objectives and purposes for activities which are conveyed to participants during the briefing phase and which, with the debriefing, form the framework within which the activities take place.
> 5. The identification of the ways of knowing and types of knowledge which any experience represents and the establishment of appropriate context, structures and relationships in which any debriefing process will take place.
> 6. The establishment of a debriefing environment based upon trust, acceptance, willingness to take risks and the mutual respect of individuals' feelings, perceptions and theories.
>
> If these simple, but essential rules are followed and supported by a skilful and sensitive group leader, then debriefing, which as a form of reflection, is the key to successful experience-based learning [and] can be highly effective.

One of the loveliest and most dedicated people in simulation and debriefing was the late Barbara Steinwachs. If I had to choose just one person to debrief me, it would be her; an editorial about her will tell you why (Crookall et al., 2004). I suggest that you grab a copy of her wonderful article, titled *How to facilitate a debriefing* (Steinwachs, 1992). Her guidance there will considerably enrich what you might have found in this chapter. Leigh and Levesque (in press) provide advice and

discussion on facilitating simulation in general and debriefing in particular. Their analysis and insight will be invaluable to you as you develop your debriefing skills. Paquay et al. (2023) provide valuable guidance on adapting debriefing programmes to evolving organisational conditions, especially in medical institutions. Many other documents, such as Deason et al. (2013) and Alklind Taylor et al. (2014), will provide some useful, practical guidance, some of which are included in the Bibliography (below).

This chapter has sought to provide an overview of debriefing mostly for learning simulation/games and to provide some nitty-gritty advice on a range of aspects related to debriefing, such as where it can take place, to whom it belongs, when and how many debriefs, why debrief, how to debrief, including how to sequence a series of games and debriefs as the backbone of a semester course. It also provides some instruments, such as debrief forms, that you can copy, adapt and use for your own games.

Now that you have read about debriefing, the next step is to go out and do it. Just as you can only learn to ride a bicycle by getting on and doing it, the only way to learn to debrief is to do it. If you are still nervous about it, ask your student–participants for help. Tell them that you have not debriefed the game before and that you are still learning and would they like to experiment along with you, see Box 14. Above all, do not let yourself be browbeaten into reducing your debriefing because some arrogant know-all tries to discourage you, often because they are afraid of the power of games and debriefing and also of your skill in being able to facilitate them.

Box 14. Asking students to help

It is easier to ask students to help than you might think. Generally, students are game for experimenting new ideas in the classroom. You just have to ask. One of the times that this happened for me was for a Masters level class at PennState, a top American university. It resulted in one of my best simulations. Normally, one is supposed to give in one's syllabus months before the class starts. I had not submitted any syllabus, which severely annoyed the university authorities. Walking down to my first class, feeling a bit scared as I still did not know what I was going to do, I suddenly hit on the idea of a semester-long simulation on the very topic of the class, pedagogical materials design. On entering the classroom, I explained the above to them and asked if they were game for exploring a new type of class with me, which might or might not be successful. They all seemed keen on the idea, despite the uncertainty—maybe because they had been bored with the usual fare of chalk-and-talk in their other classes. During the semester, students made useful suggestions as the simulation unfolded.

At the end of the semester, one student said to me, with the whole class to hear, "You know, I am proud of what I have done"—and that has stayed with me ever since. She had indeed much to be proud of; she had made a huge folder, full of excellent pedagogical materials, all original and creative, ones that her future students would be glad to use. A chalk-and-talk class would never have resulted in that!

In a subsequent university, I ran a similar (and better) simulation. Some of the students presented their work at an international conference, and were approached by a school and a publishing company, which wanted to buy their materials. Now that is a feather in any student's learning cap. The students accomplished all that, not because I taught them, but because they were participants in their own simulation and debriefing. More on that in Crookall (1990, 1991).

Chances are that you will learn together with your learners, that your relationship will strengthen and that their self-confidence will be given a boost. It is also interesting to conduct an informal debrief of your joint learning together. If, in this whole-class debrief, you are more numerous than can be accommodated in one group (e.g., more than about 10 people), then try using the fish bowl technique—I leave you to find out about that—I have found it to be very effective.

Let me finish with two interesting quotes; one insightful, the other thoughtful—I invite you to debrief in your mind to decide which is which. A debriefing friend, Stephan Rometsch, at the end of an ISAGA workshop on debriefing, came to me and said something like:

> A game is like a tasty meal in your mouth. The debriefing is digesting and absorbing nutrition.

Remember his comment when you run your event and debrief it. One might say that debriefing avoids indigestion and keeps one healthy—both your participants and you! I have three possible authors, Bill Bullard, George Eliot and Plato, for the second quote (if you find which one it is, please let me know):

> The highest form of knowledge is empathy, for it requires us to suspend our egos and live in another's world.

Finally, every time that you run a simulation/game, ask yourself if you have designed a full and proper debrief, adapted to the learner and to the learning goals. Also, ask yourself whether your debrief will be centred on the participants themselves.

Appendices

The appendices contain a number of ready-to-use materials. Some are instruments that you can use in your own debrief. Others contain elements that may be used during the game and in the debrief, such as the spreadsheet graphs produced during participation. One set of materials includes the syllabus for a whole simulation-based course on teamwork, as well as the spreadsheet graphics and forms used for debriefing. Assessment sheets can be short or long, used at the start or in the middle (usually short) or at the end or some while after (usually longer). In almost all cases, participants should be able to keep their replies to themselves, that is, not required to share them with others or the facilitator. I usually tell participants that their form is for them, that they are under no obligation to share it with (even show to) others, although they can if they wish (they usually do after a short while into the debrief).

Of course, you will have to adapt these instruments to your own particular circumstance and consider all the factors and aspects discussed elsewhere in the chapter. It is particularly important to adapt your debriefing structure and questions to your learning objectives, keeping in mind the participants' characteristics (familiarity with their subject matter, age, game experience, professional level, etc.). Please feel free to

Guide for Observers/Debriefers

As mentioned earlier, in most of the simulations that I run, I ask a small number of people to be observers during participation. I give them each a copy of this guide and spend a few moments with them to make sure that they understand at least the main ideas. I also sometimes give them a simple form to make notes during their observation, or ask them to use blank paper.

At the start of the individual debriefing, participants work in silence and fill out an individual debriefing form (see examples in the Appendix). During this time, observers study the form, go over their observation notes, and sometimes consult with each other to compare notes.

The guide is one that I tend to use, but I usually modify it for each simulation. You will obviously want to make your own, to emphasize the aspects that you consider important. If you are running a debriefer training workshop, one exercise that you can ask trainees to accomplish is to adapt the guide to a specific simulation or specific circumstances, or even to develop a guide from scratch.

Box 15. Guide for observers/debriefers

During the simulation, you will observe. Please use the observation form (given to you by the facilitator) or your own paper. After the simulation, you will help participants to debrief.

Observer: Instructions for the **gameplay** session:

1. You cannot participate in any way with your group.
2. Observe mostly your group. You may also observe other groups briefly.
3. Stay away from the group; do not go too near or interfere with the participants.
4. Keep a straight face; do not show any sign of surprise, pleasure, disappointment, etc.
5. With pen and paper, take notes on visible aspects of behaviour and interactions: Who does what.

Debriefer: Guidelines for the **debriefing** session—after the gameplay.

a. Form a **circle**—round; not oval. If necessary make people **move** to obtain a tight round circle.
b. Using a **pen**, write on the group debriefing **form**, and **summarize** the **group's** ideas. This is not a simple list from everyone's individual forms. You should summarize the **collective thoughts** of the group, which may be similar to or different from their individual answers.
c. If you have limited **time** for the discussion, go quickly over the first questions, and spend more time on the later questions. Keep an eye on your watch. Leave enough time to conclude. Each person should have more or less the same time to share.

1. Start with a word of welcome. Make people feel at **ease**. Outline the **purpose** and **spirit** of debriefing. Then invite people to **share** their **feelings** (usually the 1st question). Maintain the spirit of **exploring**, **sharing** and **learning.**
2. Affirm (encourage, thank) anyone who helps (especially at the start). Help them to overcome inertia.
3. Ensure that the spirit of **sharing** and **listening** is respected.
4. Give timid people opportunities to **express** themselves. Ask talkative people to **let others talk** too.
5. **No personal attacks**; criticism should be formulated **positively**, that is, people should focus on what can be done better next time).
6. Remain **impartial** at all times. Do not let yourself be involved in substance if people's comments are balanced and constructive. Do not allow comments that are racist or sexist, or plainly negatively prejudiced (for example, disrespectful or intolerant of difference, especially in culture and religion).
7. **Facilitate** the discussion: Do lead not too openly once it has acquired its own momentum.
8. Make sure everyone who wishes to **contribute** can do so. Remind people to speak **respectfully**.
9. Avoid "yes/no" Qs. Use "**why**?" Do not push people to speak against their will.
10. Do not tell participants what you think that they should have learned. It is for them to say what they learned (or would have liked to learn).
11. From time to time, **summarize** the general sense or main points—clarify an issue before moving to another question.

Follow the **structure** of the group debriefing form. Encourage participants to **focus** on the item in question. Bring wanderers back to the main discussion.

Notes on the above guide. Most of the instructions should make sense to you, but beginner observers and debriefers may not understand fully or forget some items. For beginners, you may wish to give them a shorter list of items. In any case, it is important to emphasize orally some of the crucial points.

Debriefers are asked to make sure that each group forms a true circle. They often miss this or consider that it is not important. So, for that instruction, I tell the whole class that forming a true circle is important so that all participants may participate equally. On the board, I sometimes draw a circle with four dots more or less equidistant from each other, with a fifth dot clearly outside the circle. I then ask if they think that the outside person is able to participate equally. Even when they clearly see that, you will occasionally get a reluctant participant sitting outside facing at a tangent to the circle, and clearly not wishing to participate. In those rare cases I go up to the group and ask them what they would like to do. I ask the recalcitrant person if they would rather stay out of the group. I also ask the other people in the group. I explain that it is perfectly ok if the person wishes to stay out, but they cannot be half in as that disturbs the work of the others. Depending on relationships, the person will decide to stay out or be convinced by others to

become part of the fold. Usually, it is the latter. Once the hesitant person has started to participate, they forget their resistance and take part fully. If the person decides not to participate, I then ask what they would like to do and/or discuss options that I offer (Table 6.9). A very useful, and far more complete, guide to observation is Hassenforder et al. (2020).

Sequence of Games and Debriefing for a Course on Teamwork

This was a semester course that I taught to master's level students. The course contained short lectures, films, gameplay classes, debriefing classes and feedback classes. Class grade was based on individual scores from games, group scores from games, end-of-semester group portfolio (score modulated by team members). Below is the sequence of classwork and out-of-class sessions, with games and debriefs feeding into each other, following the pattern in Fig. 6.8. You will notice that debriefing is done entirely in class at the start, but very soon I ask students to start in class and finish at home, and then to do it entirely at home. Some people may berate me for not tightly controlling what the students are learning; such people forget that it is impossible to determine and control what is learnt, no matter what type of classroom configuration, open and student centred or closed and sitting in neat rows. In addition, I used a spreadsheet calculator, Fig. 6.12, which I designed to provide numerical and visual feedback, based on the results from each game. You will also find an individual debrief form, Fig 6.13.

Table 6.9 Simulation- and debriefing-based teamwork training: Summary of semester syllabus showing debriefing points

Week	**Classwork** (debriefs in bold)	**Out-of-class work** (debriefs in bold)
1.	My introduction to the course: Mini lecture on using games to learn, including the importance of **debriefing**, grading sheets. Two mini interactive lectures on teamwork. Class is organized into groups (to become teams later).	Read texts on teamwork. Make notes.
2.	**Game 0** NASA Game (the main goal is to familiarize students with what it is like to participate in a game, and touch on some aspects of teamwork) + **debrief**.	Students find and prepare presentation from web-based video film on teamwork (3m to 7m).
3.	Semester teamwork project. In addition to the short in-class simulations listed above and below, students in each of their groups participate in an out-of-class simulation. In a nutshell, each group must develop a full proposal in response to a tender to set up a government teamwork centre in a country in ASEAN (each group chooses their country). The proposal must include such things as location, detailed curriculums for two sets of trainees, a budget and business plan for three years. They **debrief** this out of class, in a similar fashion to the in-class simulations. From time to time, they have to report progress with a short presentation in class. On seeing how other teams are doing, of course, rivalries develop and each team wishes to outdo the others.	

(continued)

Table 6.9 (continued)

Week	**Classwork** (debriefs in bold)	**Out-of-class work** (debriefs in bold)
4.	Presentations on films, Q&A by students and teacher. Instructions given for Game 1 Replica (including roles, rules, constraints, etc.).	Preparation for Game 1 Students prepare for Game 1, taking into account the feedback that they got from debrief of Game 0, and what they learned from mini-lectures, presentations and films.
5.	**Game 1** Replica. **Individual Debrief** = start filling out an Individual Debriefing Form.	Complete the individual, **debrief** form. Highlight points in texts relevant to the game experience.
6.	Small-**Group Debrief** of Game 1, using Group Debriefing Form.	Meet in groups and prepare **debrief** presentation for class, based on their individual and group debriefs (both structure and content), including (a) teamwork aspects, (b) performance items that were good and (c) ones that need improvement.
7.	Each group presents their out-of-class debrief, with Q&A and feedback from students, then from the teacher. Instructions given for Game 2 Towers (including roles, rules, constraints, etc.).	Preparation for Game 2 Students have to take into account the feedback that they got from the **debrief** of Game 1.
8.	Semester teamwork project. Groups present their work to date, with **debrief** (feedback) by each group on each presentation.	
9.	**Game 2** Towers. **Individual debrief** of Game 2. Start **group debrief** of Game 2.	In their groups, meet and continue and finish **group debrief**. Prepare group presentation for class, based on their individual and group debriefs (both structure and content), including (a) teamwork aspects, (b) performance items that were good and (c) ones that need improvement.
10.	Each group presents, with Q&A and feedback from students, then from the teacher. Instructions given for Game 3 Bridges (including roles, rules, constraints, etc.).	Preparation for Game 3 Students have to take into account the feedback that they got from **debriefs** of Games 1 and 2.
11.	**Game 3** Bridges **Individual debrief** of Game 3 Start **group debrief** of Game 3	In their groups, meet and continue and finish **group debrief**. Prepare group presentation for class, based on (1) their individual and group debriefs (both structure and content), including (a) teamwork aspects, (b) performance items that were good and (c) ones that need improvement, and (2) their class experience.
12.	Each team presents their **debrief** of Game 3.	
13.	Teams present their tenders for developing a teambuilding training centre and also present their training centre **debrief** session and results.	
14.	Explanations about team portfolios.	

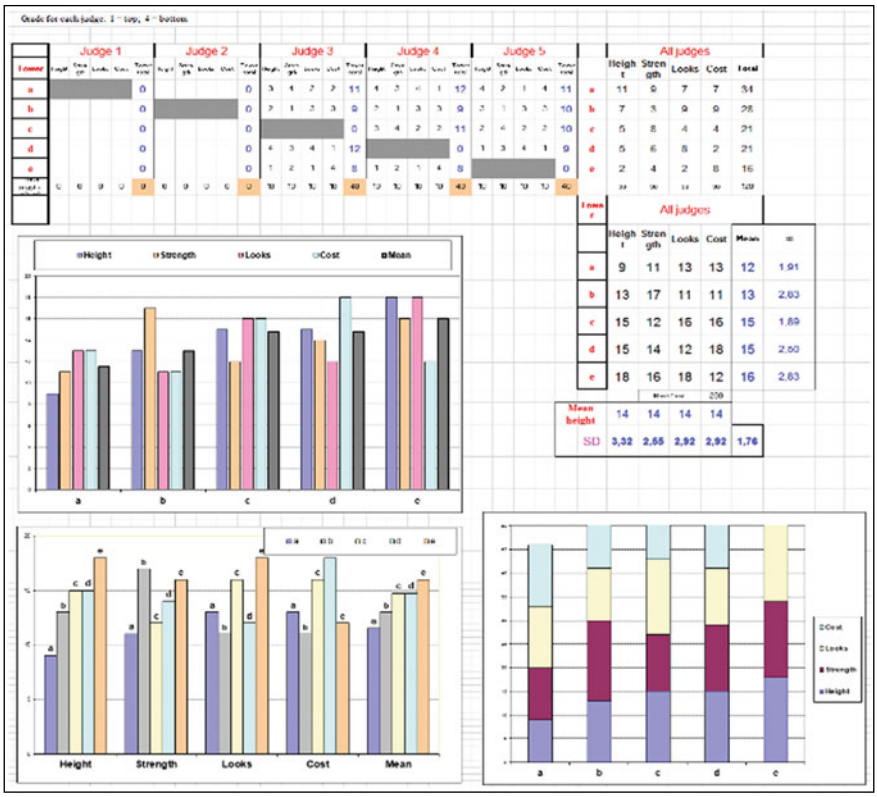

Fig. 6.12 Example of my spreadsheet calculator for teamwork simulation

Below is an example of one of the several forms used during the teamwork course. To save space, I have reduced the gap between questions. When you use this, you will, of course, need to insert sufficient space after each question to allow participants to write a few words and phrases. I typically fill one side of an A4 page, which gives ample space for students to write notes. The size of the space varies from question to question. By the time that participants get to this *Towers* form, they have already filled in two similar, but shorter, forms, so students work fairly efficiently. You will notice that Question 7 asks them about progress since the last simulation (and debriefing).

Participants fill out this form after the pause at the end of the simulation. The debrief is in two main movements. First, participants fill out the individual form below in silence. In the second movement, after they come together in small groups, either they or only the debriefer gets a similar group form to take notes about the group discussion.

Debriefing TOWERS : **Individual** work Work alone & in silence. Use a few key words or phrases - no long sentences
1. What were your **feelings** during the activity (excited, frustrated, happy, angry, achievement, belonging)?
2. What are your **feelings now**?
3. What events **happened** during the activity? Facts, behaviours, interactions.
4. What **attitudes** and non-verbal signals did you and your teammates have?
5. What **explanations** do you have for the events (facts, behaviours, attitudes, etc) in 3 & 4?.
6. Based on this experience, what are the **differences** & **similarities** between your activity and the "real world". Examples: distribution of tasks, communication patterns, attitudes, initiative, trust, listening, conflict of interests, arguments, winning/loosing, change, goals, sharing, etc.
7. **Teamwork**: Based on this experience, what are the important elements of teamwork (versus individual work or group work)?
8. **Progress**: What things do you feel have improved in this TOWERS experience over and above the things that you learned in the previous experience REPLICA?
9. The **future**: What will you as an **individual** do better next time?
10. What should your **team** do better next time?

Fig. 6.13 Individual debrief form (for towers)

Debrief form for a Short Cross-Cultural Game

This is an example of a form that I have used for a short cross-cultural game. The form takes up one A4 size page and contains space both for the silent thinking back and for making notes after the debrief (Fig. 6.14).

Form to help you debrief your experience in the cross-cultural encounter game		
Use this feedback form to make brief notes on your feelings and thoughts about your experience in the simulation. This form is private and you will not be asked to show it. You do not have to share with others what you write here, but you may if you wish. Your notes here are simply to help you think more clearly about things. However, you will be invited to take part in a discussion, during which you may, if you wish, share your feelings and thoughts		
	Individual notes just after participating in the simulation (before oral, group debriefing)	Notes during the debriefing **group** discussion
Feelings. Write a few notes about your various feelings (e.g., pleased, frustrated, angry, intrigued, accomplishment, disconcerted, badly treated, …).		
Events. Describe some of the main events. Do not explain or interpret. E.g, instead of saying "X got angry", say "X spoke loudly". Events include funny episodes; frustrating moments, odd behaviours; strange encounters.		
Interpreting & explaining events. Go back to some of the events you noted above and say why you think they happened. What interpretations and explanations do you give to them? Avoid laying blame; explain impartially.		
Other situations. Describe other situations of which you are reminded. What is similar? What is different? What aspects of the simulation experience are realistic and unrealistic?		
Learning & action. Note down one or two important things that you have learned, or one or two new ideas that you have had. What thing(s) will you do differently from now on?		

Fig. 6.14 Debriefing form for a short cross-cultural interaction game

Debriefing Materials Used for Fishbanks

Probably, the most elaborate form that I have devised is the one that I use for debriefing *Fishbanks*, a simulation designed by my long-time friend, Dennis Meadows. Over the years, the form has evolved, usually with expanded and additional questions. I have used variations of this form with several groups, such as masters level classes, fishery authorities in Thailand, the Institut d'Etudes Politiques (IEP, Sciences Po) and the Department of Fisheries at the University of Tromsø—The Arctic University of Norway. In each and every case, including the two with professionals in fisheries, the participants managed to kill all the fish.

In the formatting below, I have reduced the space for answers in each question. If you use this or modify it, you will have to expand the spaces. I usually keep debriefing forms to one page, but for this one I use two A4 pages, to give ample space for participants to reply (Fig. 6.15).

Generally, especially for this form, you need to give plenty of time for participants to write their answers. Even though you ask them to be brief, some will fill each space completely. Generally, allowing participants the time to write as much as they wish here pays dividends later during the oral sharing and discussion. Also, below are graphs of participants 'progress' through decisions.

The graphs below are produced during gameplay, with each round of decisions. Every three or four rounds, depending on how the situation is developing, I stop the game for a few minutes. I allow fishing companies (each played by about four people) to meet and discuss the situation. I also show them the results of their decisions so far. I was told once that you should not indicate anything to participants about their actions, as it would give things away. My experience is that showing them the graph and even warning them (I sometimes point out several trends, such as the more boats they put out, the more they will deplete stocks, and over time, the deep-sea catch will diminish) has little (if any?) effect on their decision-making, so hell bent are they on quenching their greed and making the most money. If anything, showing them the graphs focuses their minds and pushes them more to make agreements, which they promptly break in the next two or three rounds. In addition, the kind of data that they see in the graphs would, in real life, be available to them. The graphs are, of course, made available to participants for their debriefing (Fig. 6.16).

In the 2014 run of *Fishbanks* (Fig. 6.13), it is relatively easy to see, by comparing the graphs, why assets started to decline after round 9. Fishing companies sent almost all their boats to the coastal sea (catch for the coast) in rounds 8 and 9, which killed all the fish there, so no income was obtained in round 10, when the game ended.

In the 2016 Tromsø run (Fig. 6.17), the situation evolved in a more complex fashion. Various teams requested breaks for meetings fairly often and they sometimes lasted quite some time.

They decided about half way through to ease up on the deep-sea catch, and work on a jointly-agreed arrangement for the coast (Tot catch, coast). These agreements were broken several times, hence the wavy red line for coastal catch. In round 10 or 11, participants decided that they would make a concerted effort to save the fish. However, some fishing companies, sensing that they were arriving at the finishing line, decided to use end-game tactics in a last-ditch fling, and threw all their boats at the deep sea, with the result that you can see on the graph. It may well be that if participants had had another dozen rounds in front of them, they might have been able to stabilize their catch, but probably at less than optimal levels.

Individual debriefing form, by David Crookall, for FISHBANKS, by Dennis Meadows

Name_____ Fishing company_____ Role_____ Date_____

Work **alone** & in **silence**. Reminder: You are **no longer in** the simulation. Think b**ack** to your time in the simulation. Your replies below should be words or short phrases (not long sentences).

1. What were / are your **feelings** and **emotions**?
   a. **during** the activity (e.g., excited, sad, frustrated, happy, annoyed, accomplishment, belonging, etc)?

   b. **now**?

2. **What?** Here just **describe**; do **not explain** or interpret. What happened ? Do **not** try to explain or interpret here; be **descriptive**. Consider: Facts, events, interactions, phases. Decision processes. Teamwork in your company (clarity of objectives, role clarity, balance, responsibility, listening, etc). Ship allocation strategies used. Your company's achievements. Evolution of the fish stocks. Ship acquisition (purchase, trade, auction). Account keeping. Negotiation with other companies. Trust levels.

3. How well do you feel your company succeeded in the negotiations? How well do you feel the other companies succeeded?

4. **Why**? **Reasons** & **explanations** for events in N°2, and success / failure in N°3. For example: How did **emotions** influence events? Did **communication** problems influence events? How did **negotiation styles** influence outcomes? What was the role of **greed** (the desire to become rich, the desire to become rich**er than** others - to 'win' at all costs), and non-concern for next generations? What role did **intergroup behaviour** play? What **factors** encouraged success? What factors made things difficult?

5. **Trust.** How did your trust and feelings of trust evolve during the course of the exercise? What influenced the changes in trust? How did levels of trust influence decisions and interactions? What kinds of vicious circles developed around issues of trust. What did you do to re-establish trust, or indeed to take advantage of a climate of distrust? What about **greed**?

   … / …

6. **Objectives -** commons. What kinds of objectives did you have? How did they evolve? For example: did you assume that your main objective was to get as many **fish** (and money) as possible for your company? or did you assume that you had to share **common resources** among companies, for a **sustainable future**. What other objectives? Did you attain your objectives? Why / why not? If you did not, who was **responsible**?

7. **Real world.** What analogies can you make with the real world ? What other natural resource commons are being plundered in this way? What kinds of overshoot & collapse are we witnessing today (overshoot = using resources faster than they can regenerate; going beyond the limits of sustainability). (Examples: trees, alcohol, urbanization, debt, water, soil, etc, etc.) What about tomorrow? What are the main dangers in your lifetime?

8. **Changes**. If you were to participate again in FISH BANKS, what would you do **differently**? What different **policies** (objectives) would you pursue, and **how** would you achieve your objectives?

9. **Solutions**. What 'solutions' to consider, for fishing and for **food** in general? What kinds of measures should be taken (local, regional, global) to reduce over-exploitation, overshoot and collapse? Role of technology? Partition the seas; quotas; farm fish; eat food lower in the food chain; change consumption preferences; ban meat; ban all pollutants, insecticides, chemicals; use of technology; world government for food; monitor food better; change social values and economic incentives**.**

10. Other thoughts, questions, issues related to sustainability and the future of the planet?

11. **Your future.** In what ways will this simulation experience, and especially your heightened awareness of the **issues**, influence **your future** outlook and your future career?

Fig. 6.15 Individual debriefing form for Fishbanks

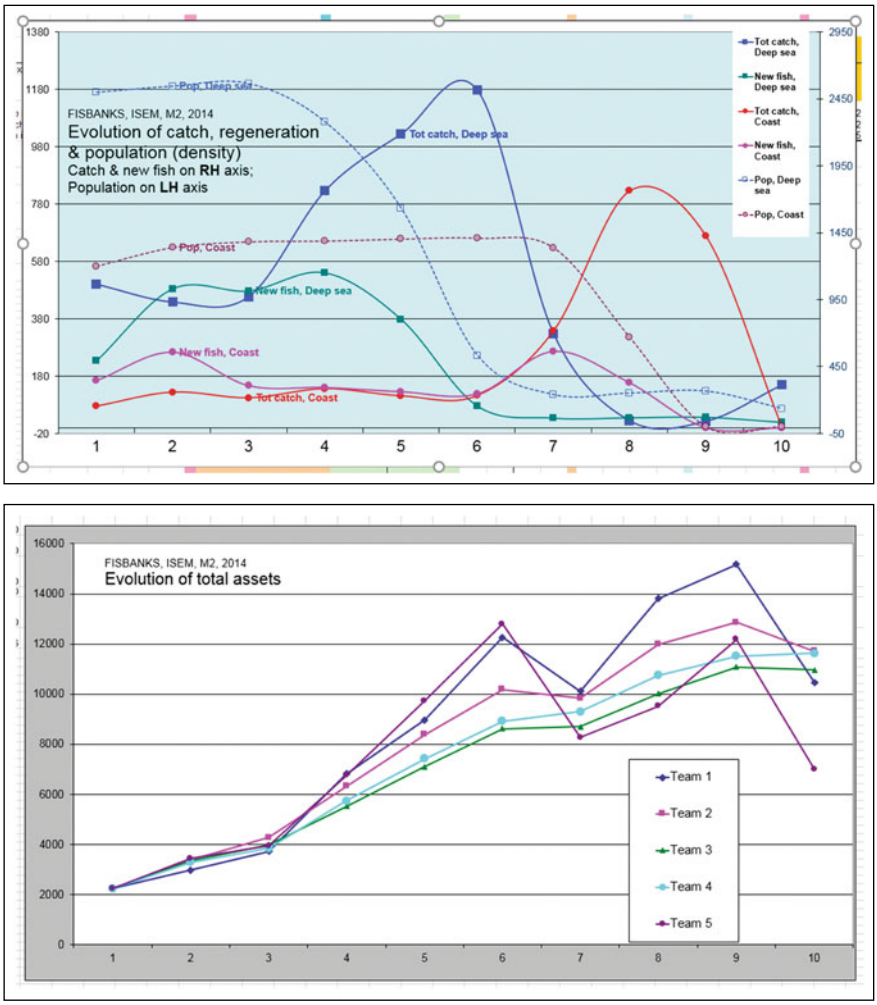

Fig. 6.16 Two graphs used for Fishbanks in a Masters level class

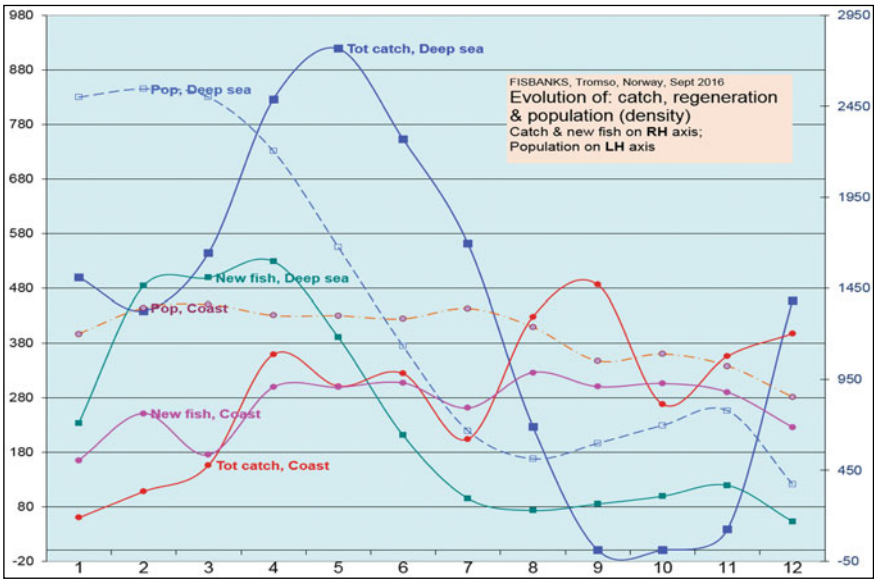

Fig. 6.17 Graph developed during Fishbanks in Tromsø University Fisheries Dept

Debriefing forms for ICEWISE

A full account of the simulation, *Icewise*, and its use will be found in (Blair et al., 2022). In a word

> Our custom-developed computerized simulation game *Icewise* integrated sea-ice parameters, forecast technology and human factors, as a participatory environment for stakeholder engagement. We explored the value of … sea-ice prediction and linked uncertainty information.

This was a one-off simulation and had not been fully tested before being used for real, that is, with its intended audience. It was, therefore, important also that the debriefing instruments were spot on. Given that the debrief had three main objectives, (1) generate data, (2) provide an opportunity for the stakeholders to discuss and compare options and (3) provide a space in which they could make preliminary decisions, the debrief was clearly as important as the simulation itself. The original form allowed more space for writing. For example, the left-hand column was narrower, which made the space for writing in the right-hand column wider and deeper (Fig. 6.18).

IceWise, Salienseas, Tromsø, Norway **individual** debriefing	1st & 2nd names _____ Org

You have now left the simulation and moved on from the emotions that you felt.
Work alone & in silence; no talking with neighbours.
For each question, write only a few key words or phrases (as a reminder for discussions later).

- Think back to the simulation and recall your participation a little bit as if as if you had been an observer.
- This form is for you to clarify and record your thoughts.
- In the upcoming discussion, you will not be required to share any more than you wish.

What were your various **feelings** / **emotions** during the simulation? Examples: pleasure, sadness, good humour, interest, frustration, curiosity, boredom, anger, calm, untrusting, hope, irrelevance?
How did your emotions **evolve** over time?

Please do not shy away from expressing your emotions, even if you generally do not do so.	Emotions are part of what makes us human. Emotions influence every aspect of our lives and decision making. Emotions are always there, even if we do not usually express them easily and openly, and even if we are not always aware of them or what type they are. After we put a name on an emotion and share it, we are in a way liberated from the taboo of the emotion, and can then think more clearly about our actions, interactions and decisions.	In the discussion that follows you will of course choose which emotions to share. However, in the space above, please write down as much as you are comfortable with mentioning.

How did your various **emotions influence**:

- Your **motivation** to participate?
- Your perception of the (lack of) **realism** of the simulation?

What **differences** and **similarities** did you see between the **simulation** and **reality**?
Examples: 1 in configuration, 2 in your participation, 3 in feelings.

What elements in the simulation influenced your sense of **confidence** in the **reliability** of **forecasts**?
Why and **how** did these elements influence your confidence?
Examples: 1 your emotions, 2 the realism of the simulation, 3 the business aspects, 4 the event cards, 5 other participants, 6 the simulation design, 7 decision making, 8 etc.

How would you **change** the simulation? What would you have put **in**, taken **out** of, or **modified** in, the simulation if you had to participate again?

In what ways has the simulation changed your **perception** of the **reliability** of MET.no's forecast product?

Are you more or less **likely** to use MET.no's new forecast product as a result of participating in the simulation? Why?

What thoughts or **ideas** of yours about voyage planning have **changed**, or new ones been **generated**, as a result of participation? What **elements** of the simulation contributed?
Examples of thoughts, ideas & elements may be: 1 simulation design, 2 simulation participation, 3 learning to play in the simulation, 4 objective reliability of forecasts, 5 your confidence in forecast reliability, 6 your confidence in voyage planning, 7 etc.

Fig. 6.18 Individual debriefing form for IceWise, Salienseas, Tromsø, Norway

What **advice** would you give to MET.no for **modification** of the design of their product?	
What advice would you offer to the simulation designers and/or the facilitators?	
What do you promise yourself to do or **do differently** as a result of participation?	
Any other **comments**?	
Thank you for your participation !	

Fig. 6.18 (continued)

After filling out the individual form, participants gathered in small groups to share experiences. They were given the group sharing form, Fig. 6.19, below, and asked to record notes during the discussion. These notes were then used in a report for the sponsors, along with a record of the decisions made during the simulation. You will notice that the cell borders have wavy lines and that the questions are in italics. This is simply so that participants and facilitators can easily distinguish between individual and group forms. I usually do that for most forms that have an individual and a group version. If it is possible, I also use a different colour paper for individual and group forms.

IceWise, Salienseas, Tromsø, Norway
***group** sharing debriefing*

1st & 2nd names _____
Org

You are now in the **sharing** phase of the debriefing. You may share anything from the previous individual work, but you are under **no obligation** to share if you do not feel comfortable sharing a particular item.
In the spaces below, do **not** simply make a catalogue of all the things that your group says; that is not the aim. From time to time, especially before you move to a new topic or section, write **notes** below
to capture the **essence**, the **overarching ideas** and/or the **general drift** of the discussion so far (not the details).
Be in the discussion, listen, share, spark new ideas, be convinced, convince; above all be **respectful**.
Make a special effort to contribute to a **balanced** discussion. Avoid talking too loudly.
Remember that **silences** are to be welcomed; they can enrich a discussion.
Always remember that the **debriefing** is the most important and **enriching** part of a simulation/game.

*What were your various **feelings** / **emotions** during the simulation?*
*Examples: pleasure, sadness, good humour, interest, frustration, curiosity, boredom, anger, calm, untrusting, hope, irrelevance, etc? How did your emotions **evolve** over time?*

*Please do not shy away from **expressing** your emotions, even if you generally do not do so.*

*Emotions are part of what makes us **human**. Emotions **influence** every aspect of our **lives** and **decision** making. Emotions are **always there**, even if we do not usually express them easily and openly, and even if we are not always aware of them or what type they are. After we put a **name** on an emotion and **share** it, we are in a way **liberated** from the **taboo** of the emotion, and can then **think** more **clearly** about our actions, interactions and decisions.*

*How did your various **emotions influence**:*
- *Your **motivation** to participate?*
- *Your perception of the (lack of) **realism** of the simulation?*

*What **differences** and **similarities** did you see between the **simulation** and **reality**?*

*What **elements** in the simulation influenced your sense of **confidence** in the **reliability** of **forecasts**?*
***Why** and **how** did these **elements** influence your confidence?*

*How would you **change** the simulation? What would you have put **in,** taken **out** of, or **modified** in, the simulation if you had to participate again?*

*In what ways has the simulation changed your **perception** of the **reliability** of MET.no's forecast product?*

*Are you **more** or **less likely** to **use** MET.no's new forecast product as a result of participating in the simulation?*

*What **thoughts** or **ideas** of yours about voyage planning have **changed**, or new ones been **generated**, as a result of participation? What **elements** of the simulation contributed?*

*What **advice** would you give to MET.no for **modification** of the design of their product?*

*What **advice** would you offer to the simulation **designers** and/or the **facilitators**?*

*What do you promise yourself to **do** or **do differently** as a result of participation?*

*What do you promise yourself to **do** or **do differently** as a result of participation?*

*Any other **comments**?*

Thank you for your participation !

Fig. 6.19 Group sharing debriefing form for IceWise, Salienseas, Tromsø, Norway

PROFFIteROLE

PROFFIteROLE (the name of a delicious French pastry) stands for "pratiques officinales et jeu de rôle", pharmacy practices and role play. It was designed at the Pharmacy Faculty in Lille (see Collomp, n.d.; Collomp et al., 2020; Decaudin & Crookall, 2015; Bodein et al., 2023). I was invited up to help with the debriefing. Together we developed a simulation-debriefing protocol that worked well.

The purpose was for pharmacy students to learn to interact with the public and follow protocols in handing over medication. We had three roles: patient, pharmacist and observer. With three different scenarios, each student in turn played one of the roles. The events took place in a simulation centre (see Fig. 6.20), and the pharmacist–patient interaction was filmed.

Debriefing was individual and collective. Among the documents provided were an observation guide (filled in by the observer), the patient's medical history, a doctor's prescription, an individual debriefing form and a collective debriefing form. As with previous forms in this Appendix, you will need to stretch them so that participants have more space to write. As a general guideline, you can fill a whole A4 page with one form.

Fig. 6.20 Simulated pharmacy in Lille

Observer guide for PROFFIteROLE	Role	First name (write below)	
Remember that this guide is not a strict evaluation instrument. It is a guide to help observers organize their observations. Interpretation of the terms in this guide and the observations remain subjective. The guide collects impressions to serve as a starting point for discussion in the debriefing.	Pharmacist Patient Observer		
Adapting the dispensing to the individual patient	Good ☐	Fair ☐	Improve ☐
Relevance of the questions	Good ☐	Fair ☐	Improve ☐
Listening to patient (information, worries, …)	Good ☐	Fair ☐	Improve ☐
Relevance of the analysis (of the prescription)	Good ☐	Fair ☐	Improve ☐
Identification of key points	Good ☐	Fair ☐	Improve ☐
Adapted dispensing (drugs / dosage / generic)	Good ☐	Fair ☐	Improve ☐
Relevance of information transmitted to the patient	Good ☐	Fair ☐	Improve ☐
Understandable information	Good ☐	Fair ☐	Improve ☐
Suitable amount of information transmitted	Good ☐	Fair ☐	Improve ☐
Welcome, attitude, approach, friendliness	Good ☐	Fair ☐	Improve ☐
Ability to convince the patient	Good ☐	Fair ☐	Improve ☐
Check list of information communicated 2 good, 1 ok, 0 missed	Explained by pharmacist	Verified by pharmacist	Understood by patient
INR monitoring			
Reporting Warfarine (Coumadin) treatment to health professionals			
What to do in case of bleeding			
Treatment plan notebook			
Nutrition (food)			
Medical advice if necessary			
Comments			

Fig. 6.21 Observer guide for PROFFIteROLE

Individual debriefing for PROFFIteROLE

Work alone; do not talk toanyone. Write just a few keywords.All ideas, thoughts, feelings and comments are welcome. Later in a discussion, you may share what you wrote, but you will not have to show your paper if you do not wish to do so.

Name _____ Role _____ Group _____ Date _____

As **pharmacist**: Use only your column	As **patient**: Use only your column	As **observer**: You may write in all 3 columns
What were your various feelings (emotions) during the role-play ? (For example, excitement, shyness, confidence or lack of, frustration, annoyance, belonging, …		
Happenings, behaviours, surprises, problems, etc. Note down just one or two.		
Differences and similarities with the 'real' world. Are those differences/similarities helpful for your learning, or a hinderance ? In what way ?		
Difficulties experienced. What specific difficulties did you experience (in regard to the situation, your role, your task, the other participants, in general, …)		
As a participant in the role-play, what things will you do differently next time ? (Examples : Jump into my role faster, forget about the observer, etc.)		
As a trainee pharmacist, what things should the role-player pharmacist do differently next time? Give suggestions for improvement, from your point of view (as pharmacist, as patient, as observer). Be specific.		
What specific things would you like to talk about in the collective discussion later ?		

Fig. 6.22 Individual debriefing for PROFFIteROLE

Collective debriefing of PROFFIteROLE – Debriefer's note-taking form

Discuss a short while, then write notes (keywords) to capture the essence of the discussion. Do not write a list of all things said, just the general idea. All ideas, thoughts, feelings, comments are welcome.

Names _____ Groupe _____ Date_____

Essence concerning / for **pharmacist**	Essence concerning / for **patient**
Feelings during the role-play.	
Happenings, sequence of events, surprises, problems, etc.	
Differences and **similarities** with the 'real' world.	
Difficulties experienced.	
As a pharmacist or trainee pharmacist (in 'real life'), what things will you **do differently** next time ?	
What things have you **learnt** (doing the activity and the debriefing) ? About delivering medication, about pharmacist-patient interaction, about pharmacist work more generally, about yourself, about life ?	
Changes. If you use this exercise in your training/teaching, what things would you change ?	
Feedback to current facilitators. What things did you like ? What things would you suggest that the facilitators do differently ? (By name is fine – we want to learn too! ☺)	

Fig. 6.23 Collective debriefing of PROFFIteROLE—Debriefer's note-taking form

Classic, 50-Year Old Book Still Relevant for Simulation and Debriefing

Many years ago, I read the now-famous book *Teaching as a subversive activity* (Postman & Weingartner, 1969). It made an indelible impression on me. In the intervening years, the authors went back on some of their ideas. Despite that, it can be an inspiration to all those in simulation and debriefing.

I always find it a little strange to hear educators talk about 'delivery', as if learning was like a product to be delivered and dumped down the throats of people, followed a while later by excruciating hurdles, called tests and exams, which no one in their right mind would contemplate doing by themselves. Imagine going to a conference to hear a speaker and they told you that you would be tested at the end; everyone would double up in laughter, and yet this is precisely what happens millions, nay, billions of times a year in schools around the world. Would it not be better for climate and vaccine deniers to put their skills to good use by demonstrating the futility of school exams and tests?

Very relevant to debriefing are these quotes from the book:

> Once you have learned how to ask questions—relevant and appropriate and substantial questions—you have learned how to learn and no one can keep you from learning whatever you want or need to know.

> Unless … perceived as relevant by the learner, no significant learning will take place. No one will learn anything he doesn't want to know.
>
> The critical content of any learning experience is the method or process through which the learning occurs.
>
> Almost any sensible parent knows this, as does any effective top sergeant. It is not what you say to people that counts; it is what you have them do. … What students do in the classroom is what they learn (as Dewey would say), and what they learn to do is the classroom's message (as McLuhan would say). Now, what is it that students do in the classroom? Well, mostly, they sit and listen to the teacher. Mostly, they are required to believe in authorities, or at least pretend to such belief when they take tests. Mostly, they are required to remember. They are almost never required to make observations, formulate definitions, or perform any intellectual operations that go beyond repeating what someone else says is true.
>
> As soon as [tests] are used as judgment-making instruments, the whole process of schooling shifts from education to training intended to produce passing grades on tests. About the only wholesome ground on which mass testing can be justified is that it provides the conditions for about the only creative intellectual activity available to students—cheating. It is quite probable that the most original "problem solving" activity students engage in in school is related to the invention of systems for beating the system. We'd be willing to accept testing if it were intended to produce this kind of creativity.

By the way, the book has a whole chapter (N°11) on games in education and mentions some of the early gamers, especially the late Harold Guetzkow (1995), one of the founders of modern academic simulation. He did me the honour of inviting me to be on a panel that he organized at a meeting of the International Studies Association and to visit him and his wife at their California retirement home. See also Guetzkow and Valadez (1981), Druckman (2011a, 2011b) and Ward (2019, 2022). The other pioneering gamers mentioned are …, well I will let you discover them for yourself when you read the book.

Bibliography

Not all the references below have been cited in the chapter. Some additional references have been inserted below to help you pursue this area further. It is also likely that some references that should have been mentioned are missing. For the missing ones please send me a link to an open access source, and failing that, to send me the missing document (pdf preferred).

Aarkrog, V. (2019). 'The mannequin is more lifelike': The significance of fidelity for students' learning in simulation-based training in the social- and healthcare programmes. *Nordic Journal of Vocational Education and Training*, 1–18. https://doi.org/10.3384/njvet.2242-458X.19921

Abulebda, K., Auerbach, M., & Limaiem, F. (2021). Debriefing techniques utilized in medical simulation. In *StatPearls*. StatPearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK546660/

Airbus. (n.d.). *Airbus Training Center Europe celebrates the certification of a new A350 Full Flight Simulator | Airbus Aircraft*. Retrieved 4 December 2021, from https://aircraft.airbus.com/en/newsroom/news/2021-10-airbus-training-center-europe-celebrates-the-certification-of-a-new-a350-full

Alexander, R. (2018a). Developing dialogic teaching: Genesis, process, trial. *Research Papers in Education, 33*(5), 561–598. https://doi.org/10.1080/02671522.2018.1481140

Alexander, R. (2018b). *Towards dialogic teaching: Rethinking classroom talk*. Dialogos.
Alexander, R. J. (2020). *A dialogic teaching companion*. Routledge.
Alklind Taylor, A.-S., Backlund, P., Rambusch, J., Linderoth, J., Forskningscentrum für Informationsteknologi, & Interaction Lab. (2014). *Facilitation matters: A framework for instructor-led serious gaming*. University of Skovde.
Angelini, M. L. (2021). Learning through simulations: Ideas for educational practitioners. SpringerBriefs in Education. In *SpringerBriefs in Education*. Springer. https://doi.org/10.1007/978-3-030-65540-2
Angelini, M. L. (2022). *Simulation in teacher education*. Springer.
Armstrong, T. (2009). *Multiple intelligences in the classroom* (3rd ed.). Association for Supervision and Curriculum Development.
Baker, A. C., Jensen, P. J., & Kolb, D. A. (1997). In conversation: Transforming experience into learning. *Simulation & Gaming, 28*(1), 6–12. https://doi.org/10.1177/1046878197281002
Bandura, A. (1977). *Social learning theory*. Prentice-Hall.
Bandura, A. (1995). *Social foundations of thought and action: A social cognitive theory*. Prenctice Hall.
Bandura, A. (2012). *Self-efficacy: The exercise of control*. Freeman.
Baudelaire, C. (1857). *Les Fleurs du mal*. Poulet-Malassis et De Broise; Éditions Gallimard.
Becu, N. (2020). *Les courants d'influence et la pratique de la simulation participative: Contours, design et contributions aux changements sociétaux et organisationnels dans les territoires*. La Rochelle Université.
Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Penguin.
Blair, B., Müller, M., Palerme, C., Blair, R., Crookall, D., Knol-Kauffman, M., & Lamers, M. (2022). Coproducing sea ice predictions with stakeholders using simulation. *Weather, Climate, and Society, 14*(2), 399–413. https://doi.org/10.1175/WCAS-D-21-0048.1
Bloom, B. S., Krathwohl, D. R., & Masia, B. B. (1956). *Taxonomy of educational objectives: The classification of educational goals*. David McKay.
Bodein, I., Forestier, M., Le Borgne, C., Lefebvre, J.-M., Pinçon, C., Garat, A., Standaert, A., & Décaudin, B. (2023). Formation des étudiants en pharmacie d'officine et en médecine générale à la communication interprofessionnelle: Évaluation d'un programme de simulation. *Annales Pharmaceutiques Françaises, 81*(2), 354–365. https://doi.org/10.1016/j.pharma.2022.06.008
Bommel, P. (2020). *Participatory modelling and interactive simulation to support the management of the commons*. University of Montpellier. http://agents.cirad.fr/pjjimg/pierre.bommel@cirad.fr/HDR_dissertation_EN.pdf
Bredemeier, M. E., & Greenblat, C. S. (1981). The educational effectiveness of simulation games: A synthesis of findings. *Simulation & Games, 12*(3), 307–332. https://doi.org/10.1177/104687818101200304
Brett-Fleegler, M., Rudolph, J., Eppich, W., Monuteaux, M., Fleegler, E., Cheng, A., & Simon, R. (2012). Debriefing assessment for simulation in healthcare: Development and psychometric properties. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 7*(5), 288–294. https://doi.org/10.1097/SIH.0b013e3182620228
Bruner, J. S. (1977). *The process of education*. Harvard University Press. http://site.ebrary.com/id/10313833
Buljac-Samardzic, M., Doekhie, K. D., & van Wijngaarden, J. D. H. (2020). Interventions to improve team effectiveness within health care: A systematic review of the past decade. *Human Resources for Health, 18*(1), 2. https://doi.org/10.1186/s12960-019-0411-3
Buxton, M., Phillippi, J. C., & Collins, M. R. (2015). Simulation: A new approach to teaching ethics. *Journal of Midwifery & Women's Health, 60*(1), 70–74. https://doi.org/10.1111/jmwh.12185
Caluwé, L., de Hofstede, G. J., & Peters, V. (2008). *Why do games work?: In search of the active substance*. Kluwer.

Cannon, H. M., Friesen, D. P., Lawrence, S. J., & Feinstein, A. H. (2009). The simplicity paradox: Another look at complexity in design of simulations and experiential exercises. *Developments in Business Simulation & Experiential Learning, 36*, 243–250.

Cattaneo, A. A. P., & Motta, E. (2021). "I Reflect, Therefore I Am… a Good Professional". On the relationship between reflection-on-action, reflection-in-action and professional performance in vocational education. *Vocations and Learning, 14*(2), 185–204. https://doi.org/10.1007/s12186-020-09259-9

Center for Medical Simulation. (2022). *Le guide d'évaluation du débriefing pour la simulation en santé*. https://harvardmedsim.org/debriefing-assessment-for-simulation-in-healthcare-dash-french/

Cheng, A., Palaganas, J., Eppich, W., Rudolph, J., Robinson, T., & Grant, V. (2015). Co-debriefing for simulation-based education: A primer for facilitators. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 10*(2), 69–75. https://doi.org/10.1097/SIH.0000000000000077

Cheng, A., Morse, K. J., Rudolph, J., Arab, A. A., Runnacles, J., & Eppich, W. (2016). Learner-centered debriefing for health care simulation education: Lessons for faculty development. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 11*(1), 32–40. https://doi.org/10.1097/SIH.0000000000000136

Cheng, A., Grant, V., Huffman, J., Burgess, G., Szyld, D., Robinson, T., & Eppich, W. (2017). Coaching the debriefer: Peer coaching to improve debriefing quality in simulation programs. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 12*(5), 319–325. https://doi.org/10.1097/SIH.0000000000000232

Chomsky, N., & Macedo, D. P. (2000). *Chomsky on miseducation*. Rowman & Littlefield Publishers.

Chomsky, N., & Otero, C. P. (2003). *Chomsky on democracy & education*. Routledge Falmer.

Christenson, S. L., Reschly, A. L., & Wylie, C. (Eds.). (2012). *Handbook of research on student engagement*. Springer. https://doi.org/10.1007/978-1-4614-2018-7

Christopher, E. M., & Smith, L. E. (1987). *Leadership training through gaming*. Kogan Page.

Clapper, T. C. (2010). Beyond Knowles: What those conducting simulation need to know about adult learning theory. *Clinical Simulation in Nursing, 6*(1), e7–e14. https://doi.org/10.1016/j.ecns.2009.07.003

Clapper, T. C. (2011). Interference in learning: What curriculum developers need to know. *Clinical Simulation in Nursing, 7*(3), e77–e80. https://doi.org/10.1016/j.ecns.2010.08.001

Clapper, T. C. (2014). Situational interest and instructional design: A guide for simulation facilitators. *Simulation & Gaming, 45*(2), 167–182. https://doi.org/10.1177/1046878113518482

Clapper, T. C. (2015). Cooperative-based learning and the zone of proximal development. *Simulation & Gaming, 46*(2), 148–158. https://doi.org/10.1177/1046878115569044

Clark, M. C., & Rossiter, M. (2008). Narrative learning in adulthood. *New Directions for Adult and Continuing Education, 2008*(119), 61–70. https://doi.org/10.1002/ace.306

Coggins, A., Hong, S. S., Baliga, K., & Halamek, L. P. (2022). Immediate faculty feedback using debriefing timing data and conversational diagrams. *Advances in Simulation, 7*(1), 7. https://doi.org/10.1186/s41077-022-00203-6

Collomp, R. (n.d.). *La simulation et Pharmacie clinique*.

Collomp, R., Collomp, T., Decaudin, B., Genay, S., Muller, K., & Orloff, M. (2020). *Atelier Simulation et Pharmacie Clinique*. 29.

Crookall, D. (1990). Task-based teacher training: CO-MADE (COperative MAterials DEvelopment). *Papers in Applied Linguistics, 2*(1), 83–106.

Crookall, D. (1991). Experiential teacher education: A case study in TESOL. *Simulaztion/Games for Learning, 21*(1).

Crookall, D. (2010a). Le débriefing, clé du processus d'apprentissage dans les pédagogies ludiques. *Actualité De La Formation Permanente, 224–225*, 21–24.

Crookall, D. (2010b). Serious games, debriefing, and simulation/gaming as a discipline. *Simulation & Gaming, 41*(6), 898–920. https://doi.org/10.1177/1046878110390784

Crookall, D. (2014). Engaging (in) gameplay and (in) debriefing. *Simulation & Gaming, 45*(4–5), 416–427. https://doi.org/10.1177/1046878114559879

Crookall, D., & Saunders, D. (Eds.). (1989). *Communication and simulation: From two fields to one theme*. Multilingual Matters. Available from https://www.researchgate.net/publication/361515008_Communication_and_Simulation_From_Two_Fields_to_One_Theme

Crookall, D., & Oxford, R. L. (Eds.). (1990). *Simulation, gaming, and language learning*. Newbury House Publishers.

Crookall, D., & Arai, K. (Eds.). (1992). *Global interdependence*. Springer Japan. https://doi.org/10.1007/978-4-431-68189-2

Crookall, D., & Promduangsri, P. (2018). Learning from geoscience games through debriefing. *Geophysical Research Abstracts*, *20*, EGU2018-4991. https://meetingorganizer.copernicus.org/EGU2018/EGU2018-4991.pdf

Crookall, D., Oxford, R., & Saunders, D. (1987). Towards a Reconceptualization of simulation: From representation to reality. *Simulation/Games for Learning*, *17*, 147–171. https://www.researchgate.net/publication/284024653_Towards_a_Reconceptualization_of_Simulation_From_Representation_to_Reality

Crookall, D., Steinwachs, B., et al. (2004). Editorial: Thank you, Barbara. *Simulation & Gaming*, *35*(3), 325–339. https://doi.org/10.1177/1046878104267078

Csikszentmihalyi, M. (2014). *Applications of flow in human development and education*. Springer.

Csikszentmihalyi, M. (2016). *Flow and the foundations of positive psychology*. Springer.

de Caluwe, L., Hofstede, G. J., & Peters, V. (2008). *Why do games work? In search of the active substance*.

de Wijse-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332. https://doi.org/10.1177/1046878121101570 7

de Wijse-van Heeswijk, M., & Leigh, E. (2022). Ethics and simulation games in a cultural context: Why should we bother? And what can we learn? In T. Kikkawa, W. C. Kriz, & J. Sugiura (Eds.), *Gaming as a cultural commons: Risks, challenges, and opportunities* (pp. 149–167). Springer Nature. https://doi.org/10.1007/978-981-19-0348-9_9

Deason, E. E., Efron, Y., Howell, R. W., Kaufman, S., Lee, J., & Press, S. (2013). Debriefing the debrief. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2251940

Decaudin, B., & Crookall, D. (2015). *Experiential learning in pharmacotherapy implementation: Focus on debriefing*.

Decker, S., Alinier, G., Crawford, S. B., Gordon, R. M., Jenkins, D., & Wilson, C. (2021). Healthcare Simulation Standards of Best Practice™: The debriefing process. *Clinical Simulation in Nursing, 58*, 27–32. https://doi.org/10.1016/j.ecns.2021.08.011

Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L. (Rocky), Boese, T., Franklin, A. E., Gloe, D., Lioce, L., Sando, C. R., Meakim, C., & Borum, J. C. (2013). Standards of best practice: Simulation standard VI: The debriefing process. *Clinical Simulation in Nursing, 9*(6), S26–S29. https://doi.org/10.1016/j.ecns.2013.04.008

Dennehy, R. F., Sims, R. R., & Collins, H. E. (1998). Debriefing experiential learning exercises: A theoretical and practical guide for success. *Journal of Management Education, 22*(1), 9–25. https://doi.org/10.1177/105256299802200102

Dewey, J. (1916 & 1997). *Democracy and education: An introduction to the philosophy of education*. Macmillan & Free Press.

Dewey, J. (1938). *Experience and education*. Free Press.

Djaouti, D., Alvarez, J., Jessel, J.-P., & Rampnoux, O. (2011). Origins of serious games. In M. Ma, A. Oikonomou, & L. C. Jain (Eds.), *Serious games and edutainment applications* (pp. 25–43). Springer London. https://doi.org/10.1007/978-1-4471-2161-9_3

Dragonas, T., Gergen, K. J., McNamee, S., & Tseliou, E. (2015). *Education as social construction: Contributions to theory, research and practice*. The Taos Institute.

Dreifuerst, K. (2015). Getting started with debriefing for meaningful learning. *Undefined*. https://www.semanticscholar.org/paper/Getting-Started-With-Debriefing-for-Meaningful-Dreifuerst/3037be1db778f8f0de5c13b8aa33e3253892f615

Druckman, D. (2011a). Remembering Harold Guetzkow. *Simulation & Gaming, 42*(3), 290–293. https://doi.org/10.1177/1046878110393881

Druckman, D. (2011b). The influence of Harold Guetzkow: Scholarship and values. *Simulation & Gaming, 42*(3), 314–322. https://doi.org/10.1177/1046878110393913

Dufrene, C., & Young, A. (2014). Successful debriefing—Best methods to achieve positive learning outcomes: A literature review. *Nurse Education Today, 34*(3), 372–376. https://doi.org/10.1016/j.nedt.2013.06.026

Duke, R. D. (1974). *Gaming: The future's language*. Sage.

Duke, R. D. (2011). Origin and evolution of policy simulation: A personal journey. *Simulation & Gaming, 42*(3), 342–358. https://doi.org/10.1177/1046878110367570

Duke, R. D., & Kriz, W. C. (Eds.). (2014). *Back to the future of gaming*. W. Bertelsmann Verlag. http://site.ebrary.com/id/11058796

Dunn, R. S., & Dunn, K. J. (1978). *Teaching students through their individual learning styles: A practical approach*. Reston Pub. Co.

Dunning–Kruger effect. (2023). In Wikipedia. https://en.wikipedia.org/wiki/Dunning-Kruger_effect. Accessed 1 August, 2023.

Earp, J., Persico, D., Dagnino, F. M., Passarelli, M., Manganello, F., & Pozzi, F. (2018). *Ethical issues in gaming: A literature review*.

Endacott, R., Gale, T., O'Connor, A., & Dix, S. (2019). Frameworks and quality measures used for debriefing in team-based simulation: A systematic review. *BMJ Simulation and Technology Enhanced Learning, 5*(2), 61–72. https://doi.org/10.1136/bmjstel-2017-000297

Étienne, M. (Ed.). (2014). *Companion modelling*. Springer Netherlands. https://doi.org/10.1007/978-94-017-8557-0

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 2*(2), 115–125. https://doi.org/10.1097/SIH.0b013e3180315539

Flavell, J. H. (1976). Metacognitive aspects of problem-solving. In L. B. Resnick (dir.), *The nature of intelligence* (pp. 231–235). Hillsdale, NJ: Lawrence Erlbaum Associates.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist, 34*(10), 906–911. https://doi.org/10.1037/0003-066X.34.10.906

Flavell, J. H. (1987). Speculations about the nature and development of metacognition. In F. E. Weinert, R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 21–29). Hillsdale, NJ: Lawrence Erlbaum.

Flecha, R. (2000). *Sharing words: Theory and practice of dialogic learning.* Rowman & Littlefield Publishers. https://archive.org/details/sharingwordstheo0000flec

Francis, D. (1989). Game identities and activities: Some ethnomethodological observations. In D. Crookall & D. Saunders (Eds.), *Communication and simulation: From two fields to one theme*. Multilingual Matters.

Freire, P., & Freire, A. M. A. (2021). *Pedagogy of hope: Reliving pedagogy of the oppressed*. Bloomsbury. https://doi.org/10.5040/9781350190238

Freire, P., Ramos, M. B., Macedo, D. P., & Shor, I. (2020). *Pedagogy of the oppressed*.

Games for change. (2021). *Games for change*. Games For Change. https://www.gamesforchange.org/who-we-are/about-us/

García-Carbonell, A., Watts, F., & Montero, B. (2004). Learning communities in simulation and gaming. In W. C. Kriz & T. Eberle (Eds.), *Bridging the gap: Transforming knowledge into action through gaming and simulation: ISAGA, SAGSAGA Conference Munich 2004* (pp. 254–262). SAGSAGA.

García-Carbonell, A., Andreu-Andrés, M. Á., & Watts, F. (2014). Simulation and gaming as the future's language of language learning and acquisition of professional competences. In W. C. Kriz & R. D. Duke (Eds.), *Back to the future of gaming* (p. 23).

Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences*. BasicBooks.

Gardner, R. (2013). Introduction to debriefing. *Seminars in Perinatology, 37*(3), 166–174. https://doi.org/10.1053/j.semperi.2013.02.008

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & Gaming, 33*(4), 441–467. https://doi.org/10.1177/1046878102238607

Gaw, B. A. (1979). Processing questions: An aid to completing the learning cycle. In J. E. Jones, J. W. Pfeiffer (Eds.), *The 1979 annual handbook for group facilitator* (pp. 147–153). La Jolla, CA: University Associates.

Giles, H. (Ed.). (n.d.). *Journal of Language and Social Psychology*. https://journals.sagepub.com/description/JLS

Goldsworthy, S., Goodhand, K., Baron, S., Button, D., Hunter, S., McNeill, L., Budden, F., McIntosh, A., Kay, C., & Fasken, L. (2022). Co-debriefing virtual simulations: An international perspective. *Clinical Simulation in Nursing, 63*, 1–4. https://doi.org/10.1016/j.ecns.2021.10.007

Goleman, D. (1998). *Working with emotional intelligence*. Bantam Books.

Goodman, F. L. (1995). Practice in theory. *Simulation & Gaming, 26*(2), 178–190. https://doi.org/10.1177/1046878195262005

Greenblat, C. S., & Duke, R. D. (1981). *Principles and practices of gaming-simulation*. Sage Publications.

Guetzkow, H. (1995). Recollections about the inter-nation simulation (INS) and some derivatives in global modeling. *Simulation & Gaming, 26*(4), 453–470. https://doi.org/10.1177/1046878195264007

Guetzkow, H. S., & Valadez, J. J. (Eds.). (1981). *Simulated international processes: Theories and research in global modeling*. Sage Publications.

Gum, L., Greenhill, J., & Dix, K. (2011). Sim TRACT™: A reflective conceptual framework for simulation debriefing. *Journal of Transformative Education, 9*(1), 21–41. https://doi.org/10.1177/1541344611428470

Hall, J. (2011). Reality is broken, book review. *The Independent on Sunday*. https://www.textualhealing.co.uk/2011/01/30/reality-is-broken/

Hallinger, P., Wang, R., Chatpinyakoop, C., Nguyen, V.-T., & Nguyen, U.-P. (2020). A bibliometric review of research on simulations and serious games used in educating for sustainability, 1997–2019. *Journal of Cleaner Production, 256*, 120358. https://doi.org/10.1016/j.jclepro.2020.120358

Harviainen, J. T. (2014). Critical challenges to gamifying education: A review of central concepts. In *Proceedings of the Game On! Conference* (Vol. 9).

Harviainen, J. T., Lainema, T., & Saarinen, E. (2014). Player-reported Impediments to Game-based Learning. *Transactions of the Digital Games Research Association*, *1*(2), Article 2. http://todigra.org/index.php/todigra/article/view/14

Hassenforder, E., Dray, A., & Daré, W. (2020). *Manuel d'observation des jeux sérieux*. ComMod; CIRAD. https://doi.org/10.19182/agritrop/00113

Hiemstra, R., & Brockett, R. (2020). *Self-direction in adult learning: Perspectives on theory, research and practice*. Routledge.

Hill, J. L., & Lance, C. G. (2002). Debriefing stress. *Simulation & Gaming, 33*(4), 490–503. https://doi.org/10.1177/1046878102238613

Hofstede, G. J., de Caluwé, L., & Peters, V. (2010). Why simulation games work—In search of the active substance: A synthesis. *Simulation & Gaming, 41*(6), 824–843. https://doi.org/10.1177/1046878110375596

Holec, H. (1981a). *Autonomie dans l'apprentissage et apprentissage de l'autonomie*. Didier Erudition.

Holec, H. (1981b). *Autonomy and foreign language learning*. Pergamon.
Holec, H. (1988). *Autonomy and self-directed learning: Present fields of application*. Council for Cultural Co-operation.
Honey, P., & Mumford, A. (1986). *The manual of learning styles* (2nd ed). Peter Honey.
Hunsaker, P. L. (1978). Debriefing: The key to effective experiential learning. *Exploring Experiential Learning: Simulations and Experiential Exercises, 5*, 2.
Illeris, K. (2018). *Contemporary theories of learning: Learning theorists ... in their own words*. Routledge.
INACSL Standards Committee. (2016). INACSL standards of best practice: SimulationSM debriefing. *Clinical Simulation in Nursing, 12*, S21–S25. https://doi.org/10.1016/j.ecns.2016.09.008
Jacobs, G. M., & Kimura, H. (2013). *Cooperative learning and teaching*. TESOL Press.
Jacobs, G. M., & Crookes, G. (2022). *Becoming community-engaged educators: Engaging students within and beyond the classroom walls*. Springer.
Johnson, A. P. (2022). *The human dimension in education: Essential learning theories and their impact on teaching and learning*. Rowman & Littlefield.
Johnson, D. W., & Johnson, R. T. (1987). *Learning together and alone: Cooperative, competitive and individualistic learning*. Prentice-Hall.
Jones, K. (1998). *Interactive learning events: A guide for facilitators.* Kogan Page.
Kegan, R., & Lahey, L. L. (2001). *How the way we talk can change the way we work: Seven languages for transformation* (1st ed.). Jossey-Bass.
Kikkawa, T., Sugiura, J., & Kriz, W. C. (2018). The effects of debriefing on the performance and attitude of Japanese university students. In H. K. Lukosch, G. Bekebrede, & R. Kortmann (Eds.), *Simulation gaming. Applications for sustainable cities and smart infrastructures* (Vol. 10825, pp. 173–180). Springer International Publishing. https://doi.org/10.1007/978-3-319-91902-7_17
Kikkawa, T., Kriz, W. C., & Sugiura, J. (2021). Differences between facilitator-guided and self-guided debriefing on the attitudes of university students. In M. Wardaszko, S. Meijer, H. Lukosch, H. Kanegae, W. C. Kriz, & M. Grzybowska-Brzezińska (Eds.), *Simulation gaming through times and disciplines* (pp. 14–22). Springer. https://doi.org/10.1007/978-3-030-72132-9_2
Kim, Y. Y. (2000). *Becoming intercultural: An integrative theory of communication and cross-cultural adaptation*. Sage.
Kirylo, J. D. (Ed.). (2013). *A critical pedagogy of resistance*. Sense Publishers.
Klabbers, J. H. G. (2009). The magic circle: Principles of gaming & simulation. *Sense*. https://doi.org/10.1163/9789087903107
Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2d ed.). Pearson Education, Inc.
Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education, 4*(2), 193–212. https://doi.org/10.5465/amle.2005.17268566
Kolb, A. Y., & Kolb, D. A. (2009). The learning way: Meta-cognitive aspects of experiential learning. *Simulation & Gaming, 40*(3), 297–327. https://doi.org/10.1177/1046878108325713
Kolb, A., & Kolb, D. A. (2013). *Kolb learning style inventory*. HayGroup.
Kortmann, R., & Peters, V. (2021). Becoming the unseen helmsman—Game facilitator competencies for novice, experienced, and non-game facilitators. *Simulation & Gaming, 52*(3), 255–272. https://doi.org/10.1177/10468781211020792
Kourgiantakis, T., Sewell, K. M., Hu, R., Logan, J., & Bogo, M. (2020). Simulation in social work education: A scoping review. *Research on Social Work Practice, 30*(4), 433–450. https://doi.org/10.1177/1049731519885015
Kriz, W. C. (2003). Creating effective learning environments and learning organizations through gaming simulation design. *Simulation & Gaming, 34*(4), 495–511. https://doi.org/10.1177/1046878103258201

Kriz, W. C. (2008). A systemic-constructivist approach to the facilitation and debriefing of simulations and games. *Simulation & Gaming, 41*(5), 663–680. https://doi.org/10.1177/1046878108319867

Kriz, W. (Ed.). (2014). *The shift from teaching to learning: Individual, collective and organizational learning through gaming simulation*.

Kriz, W. C., & Duke, R. D. (2014). *Back to the future of gaming*. WBV.

Krogh, K., Bearman, M., & Nestel, D. (2015). Expert practice of video-assisted debriefing: An Australian qualitative study. *Clinical Simulation in Nursing, 11*(3), 180–187. https://doi.org/10.1016/j.ecns.2015.01.003

Krogh, K., Bearman, M., & Nestel, D. (2016). "Thinking on your feet"—A qualitative study of debriefing practice. *Advances in Simulation, 1*(1), 12. https://doi.org/10.1186/s41077-016-0011-4

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*(6), 1121–1134. https://doi.org/10.1037/0022-3514.77.6.1121

Kruger, J., & Dunning, D. (2002). Unskilled and unaware—but why? A reply to Krueger and Mueller. *Journal of Personality and Social Psychology, 82*(2), 189–192. https://doi.org/10.1037/0022-3514.82.2.189

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*.

Le Page, C., Dray, A., Perez, P., & Garcia, C. (2014). *Can communication save the commons? Lessons from repeated role-playing game sessions*. ETH-Zurich.

Le Page, C., Dray, A., Perez, P., & Garcia, C. (2016). Exploring how knowledge and communication influence natural resources management with ReHab. *Simulation & Gaming, 47*(2), 257–284. https://doi.org/10.1177/1046878116632900

Lean, J., & Moizer, J. (n.d.). *Using oral debriefing to assess student learning in a business simulation game* (Vol. 9).

Lederman, L. C. (1984). Debriefing: A critical reexamination of the postexperience analytic process with implications for its effective use. *Simulation & Games, 15*(4), 415–431. https://doi.org/10.1177/0037550084154002

Lederman, L. C. (1992a). Debriefing: Toward a systematic assessment of theory and practice. *Simulation & Gaming, 23*(2), 145–160. https://doi.org/10.1177/1046878192232003

Lederman, L. C. (1992b). Guest editorial: After the game is over. *Simulation & Gaming, 23*(2), 143–144. https://doi.org/10.1177/1046878192232002

Leigh, E., & Spindler, L. (2004). Simulations and games as chaordic learning contexts. *Simulation & Gaming, 35*(1), 53–69. https://doi.org/10.1177/1046878103252886

Leigh, E., Likhacheva, E., Tipton, E., Heeswijk, M. de W., & Zürn, B. (2021). Why facilitation? *Simulation & Gaming, 52*(3), 247–254. https://doi.org/10.1177/10468781211016914

Leigh, E., & Levesque, L. (in press). *Effective facilitation of simulations and computer simulations*. Edward Elgar Publishing.

Lennon, J. L. (2006). Debriefings of web-based malaria games. *Simulation & Gaming, 37*(3), 350–356. https://doi.org/10.1177/1046878106291661

Lennon, J. L., & Coombs, D. W. (2005). The good-bye to dengue game: Debriefing study. *Simulation & Gaming, 36*(4), 499–517. https://doi.org/10.1177/1046878105279194

Lovell-Hawker, D. (2004). *Debriefing aid workers: A comprehensive manual*. Oxford University.

Luctkar-Flude, M., Tyerman, J., Verkuyl, M., Goldsworthy, S., Harder, N., Wilson-Keates, B., Kruizinga, J., & Gumapac, N. (2021). Effectiveness of debriefing methods for virtual simulation: A systematic review. *Clinical Simulation in Nursing, 57*, 18–30. https://doi.org/10.1016/j.ecns.2021.04.009

Lyons, R., Lazzara, E. H., Benishek, L. E., Zajac, S., Gregory, M., Sonesh, S. C., & Salas, E. (2015). Enhancing the effectiveness of team debriefings in medical simulation: More best practices. *The Joint Commission Journal on Quality and Patient Safety, 41*(3), 115–125. https://doi.org/10.1016/S1553-7250(15)41016-5

Maley, A. (2015). Six ways of looking at context. *Journal of NELTA, 20*(1–2), 1–4. https://doi.org/10.3126/nelta.v20i1-2.19770

Malinen, A. (2000). *Towards the essence of adult experiential learning: A reading of the theories of Knowles, Kolb, Mezirow*. University of Jyväskylä.

Massoth, C., Röder, H., Ohlenburg, H., Hessler, M., Zarbock, A., Pöpping, D. M., & Wenk, M. (2019). High-fidelity is not superior to low-fidelity simulation but leads to overconfidence in medical students. *BMC Medical Education, 19*(1), 29. https://doi.org/10.1186/s12909-019-1464-7

Mercer, N., Wegerif, R., & Major, L. (2019). *The routledge international handbook of research on dialogic education*. Taylor & Francis.

Mezirow, J. (1991). *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning*. Jossey-Bass.

Myers, I. B. (2014). *The Myers-Briggs type indicator*. Consulting Psychologists Press.

Nakamura, M. (2022). Code of conduct for facilitators and the ethics of debriefing. In T. Kikkawa, W. C. Kriz, & J. Sugiura (Eds.), *Gaming as a cultural commons: Risks, challenges, and opportunities* (pp. 127–147). Springer Nature. https://doi.org/10.1007/978-981-19-0348-9_8

Nakamura, M. (2023). Moderate tension enables an open discussion: Text analysis of written comments in debriefings. *Paper presented at the 2023 ISAGA Conference*, La Rochelle.

Naweed, A., Wardaszko, M., Leigh, E., & Meijer, S. (Eds.). (2018). *Intersections in Simulation and Gaming: 21st Annual Simulation Technology and Training Conference, SimTecT 2016, and 47th International Simulation and Gaming Association Conference, ISAGA 2016*. Springer International Publishing. https://doi.org/10.1007/978-3-319-78795-4

Nicholson, S. (2012). *Completing the experience: Debriefing in experiential educational games* (Vol. 5).

Nyström, S., Dahlberg, J., Edelbring, S., Hult, H., & Abrandt Dahlgren, M. (2016). Debriefing practices in interprofessional simulation with students: A sociomaterial perspective. *BMC Medical Education, 16*(1), 148. https://doi.org/10.1186/s12909-016-0666-5

Oriot, D., & Alinier, G. (2018). *Pocket book for simulation debriefing in healthcare*. Springer International Publishing. https://doi.org/10.1007/978-3-319-59882-6

Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury House Publisher.

Paquay, M., Simon, R., Ancion, A., Graas, G., & Ghuysen, A. (2023). A success story of clinical debriefings: Lessons learned to promote impact and sustainability. *Frontiers in Public Health, 11*, 1188594. https://doi.org/10.3389/fpubh.2023.1188594

Park, C., Murphy, T., & the Code of Ethics Working Group. (2018). *Healthcare simulationist code of ethics*. Society for Simulation in Healthcare. http://www.ssih.org/Code-of-Ethics

Pearson, M., & Smith, D. (1985). Debriefing in experience-based learning. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning*. Kogan Page [u.a.].

Pedersen, P. (1995). Simulations: A safe place to take risks in discussing cultural differences. *Simulation & Gaming, 26*(2), 201–206. https://doi.org/10.1177/1046878195262007

Peters, V., Vissers, G., & Heijne, G. (1998). The validity of games. *Simulation & Gaming, 29*(1), 20–30.

Peters, V. A. M., & Vissers, G. A. N. (2004). A simple classification model for debriefing simulation games. *Simulation & Gaming, 35*(1), 70–84. https://doi.org/10.1177/1046878103253719

Petranek, C. (1994). A maturation in experiential learning: Principles of simulation and gaming. *Simulation & Gaming, 25*(4), 513–523. https://doi.org/10.1177/1046878194254008

Petranek, C. F. (2000). Written debriefing: The next vital step in learning with simulations. *Simulation & Gaming, 31*(1), 108–118. https://doi.org/10.1046878100003100111

Phillion, J., He, M. F., & Connelly, F. M. (Eds.). (2005). *Narrative and experience in multicultural education*. Sage Publications.

Phillips, D. C. (Ed.). (2014). *Encyclopedia of educational theory and philosophy*. SAGE Reference.

Politècnica, U., & de València, E. (2014). Universitat Politècnica de València. *Ingeniería Del Agua, 18*(1), ix. https://doi.org/10.4995/ia.2014.3293

Postman, N., & Weingartner, C. (1969). *Teaching as a subversive activity*. Penguin.

Powers, R. B. (1992). The new commons game. In D. Crookall & K. Arai (Eds.), *Global interdependence*. Springer Japan. https://doi.org/10.1007/978-4-431-68189-2

Powers, R. B. (2014). How I became addicted to simulations and games. *Simulation & Gaming, 45*(1), 5–22. https://doi.org/10.1177/1046878113501834

Pritchard, A. (2018). *Ways of learning: Learning theories for the classroom*. Routledge, Taylor & Francis.

Pulsford, D. (1993). The reluctant participant in experiential learning. *Nurse Education Today, 13*(2), 139–144. https://doi.org/10.1016/0260-6917(93)90031-V

Ranchhod, A., Gurău, C., Loukis, E., & Trivedi, R. (2014). Evaluating the educational effectiveness of simulation games: A value generation model. *Information Sciences, 264*, 75–90. https://doi.org/10.1016/j.ins.2013.09.008

Randel, J. M., Morris, B. A., Wetzel, C. D., & Whitehill, B. V. (1992). The effectiveness of games for educational purposes: A review of recent research. *Simulation & Gaming, 23*(3), 261–276. https://doi.org/10.1177/1046878192233001

Reed, S. J., Andrews, C. M., & Ravert, P. (2013). Debriefing simulations: Comparison of debriefing with video and debriefing alone. *Clinical Simulation in Nursing, 9*(12), e585–e591. https://doi.org/10.1016/j.ecns.2013.05.007

Reyes, D. L., Tannenbaum, S., & Salas, E. (2018). *Team development: The power of debriefing*. https://www.shrm.org/executive/resources/people-strategy-journal/Spring2018/Pages/debriefing.aspx

Rossiter, M., & Clark, M. C. (2007). *Narrative and the practice of adult education*. Krieger Pub. Co.

Rooney-Varga, J. N., Hensel, M., McCarthy, C., McNeal, K., Norfles, N., Rath, K., Schnell, A. H., & Sterman, J. D. (2021). Building consensus for ambitious climate action through the world climate simulation. *Earth's Future, 9*(12), e2021EF002283. https://doi.org/10.1029/2021EF002283

Rooney-Varga, J. N., Kapmeier, F., Sterman, J. D., Jones, A. P., Putko, M., & Rath, K. (2020). The climate action simulation. *Simulation & Gaming, 51*(2), 114–140. https://doi.org/10.1177/1046878119890643

Rooney-Varga, J. N., Sterman, J. D., Fracassi, E., Franck, T., Kapmeier, F., Kurker, V., Johnston, E., Jones, A. P., & Rath, K. (2018). Combining role-play with interactive simulation to motivate informed climate action: Evidence from the World Climate simulation. *PLOS ONE, 13*(8), e0202877. https://doi.org/10.1371/journal.pone.0202877

Roungas, B., de Wijse, M., Meijer, S., & Verbraeck, A. (2018). Pitfalls for debriefing games and simulations: Theory and practice. In A. Naweed, M. Wardaszko, E. Leigh, & S. Meijer (Eds.), *Intersections in simulation and gaming* (pp. 101–115). Springer International Publishing. https://doi.org/10.1007/978-3-319-78795-4_8

Roungas, B., Meijer, S., & Verbraeck, A. (2021). The tacit knowledge in games: From validation to debriefing. In M. Wardaszko, S. Meijer, H. Lukosch, H. Kanegae, W. C. Kriz, & M. Grzybowska-Brzezińska (Eds.), *Simulation gaming through times and disciplines* (pp. 74–83). Springer International Publishing. https://doi.org/10.1007/978-3-030-72132-9_7

Ruben, B. D., & Lederman, L. C. (1982). Instructional simulation gaming: Validity, reliability, and utility. *Simulation & Games, 13*(2), 233–244.

Rudolph, J. W., Simon, R., Dufresne, R. L., & Raemer, D. B. (2006). There's no such thing as "Nonjudgmental" debriefing: A theory and method for debriefing with good judgment. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare*, *1*(1), 49–55. https://doi.org/10.1097/01266021-200600110-00006

Rudolph, J. W., Simon, R., Rivard, P., Dufresne, R. L., & Raemer, D. B. (2007). Debriefing with good judgment: Combining rigorous feedback with genuine inquiry. *Anesthesiology Clinics, 25*(2), 361–376. https://doi.org/10.1016/j.anclin.2007.03.007

Runnacles, J., Thomas, L., Sevdalis, N., Kneebone, R., & Arora, S. (2014). Development of a tool to improve performance debriefing and learning: The paediatric objective structured assessment of debriefing (OSAD) tool. *Postgraduate Medical Journal, 90*(1069), 613–621. https://doi.org/10.1136/postgradmedj-2012-131676

Salas, E., Klein, C., King, H., Salisbury, M., Augenstein, J. S., Birnbach, D. J., Robinson, D. W., & Upshaw, C. (2008). Debriefing medical teams: 12 evidence-based best practices and tips. *The Joint Commission Journal on Quality and Patient Safety, 34*(9), 518–527. https://doi.org/10.1016/S1553-7250(08)34066-5

Saunders, D. (1985). Reluctant participants in role play situations: Stage fright or bewilderment? *Simulation/Games for Learning*, *15*(1, March), 3–15.

Sawyer, T., Eppich, W., Brett-Fleegler, M., Grant, V., & Cheng, A. (2016). More than one way to debrief: A critical review of healthcare simulation debriefing methods. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 11*(3), 209–217. https://doi.org/10.1097/SIH.0000000000000148

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Schön, D. A. (1990). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. Jossey-Bass.

Schunk, D. H. (2020). *Learning theories: An educational perspective*.

Schwägele, S., Zürn, B., Lukosch, H. K., & Freese, M. (2021). Design of an impulse-debriefing-spiral for simulation game facilitation. *Simulation & Gaming, 52*(3), 364–365. https://doi.org/10.1177/10468781211006752

Schwartz. (2002). *Assumptions underlying experiential exercises*.

Schwartz, M. (2012). *Best practices in experiential learning*. Ryerson University.

Secheresse, T., Mampe-Armstrong, H., Usseglio, P., Jorioz, C., Bonnet-Gonnet, J.-F., & Dumas, J. (2016). Le débriefing postsimulation en santé. Que nous apprend-il et comment? *Réanimation, 25*(S2), 100–106. https://doi.org/10.1007/s13546-015-1154-3

Secheresse, T., Pansu, P., & Lima, L. (2021). Quel est le type de débriefing post-simulation le plus efficace pour des apprenants expérimentés ? Une étude prospective randomisée. *Pédagogie Médicale, 22*(4), 159–166. https://doi.org/10.1051/pmed/2021023

Sellberg, C., & Wiig, A. C. (2020). Telling stories from the sea: Facilitating professional learning in maritime post-simulation debriefings. *Vocations and Learning, 13*(3), 527–550. https://doi.org/10.1007/s12186-020-09250-4

Sharrock, W. W., & Watson, D. R. (1985). 'Reality construction' in L2 simulations. *System, 13*(3), 195–206. https://doi.org/10.1016/0346-251X(85)90033-8

Simon, R., Raemer, D. B., & Rudolph, J. W. (2010). *Debriefing assessment for simulation in healthcare (DASH)© Rater's handbook. Center for medical simulation*. https://harvardmedsim.org/wp-content/uploads/2017/01/DASH.handbook.2010.Final.Rev.2.pdf

Sjöblom, B. (2006). *To do what we usually do: An ethnomethodological investigation of intensive care simulations*. https://www.researchgate.net/publication/277851938_To_do_what_we_usually_do_An_ethnomethodological_investigation_of_intensive_care_simulations

Skidmore, D. D., & Murakami, K. (2016). *Dialogic pedagogy: The importance of dialogue in teaching and learning*. Multilingual Matters.

Smith, J. Z. (2022). *Myth*. Encyclopædia Britannica. https://www.britannica.com/topic/myth

Steinwachs, B. (1992). How to facilitate a debriefing. *Simulation & Gaming, 23*(2), 186–195. https://doi.org/10.1177/1046878192232006

Sterman, J., Franck, T., Fiddaman, T., Jones, A., McCauley, S., Rice, P., Sawin, E., Siegel, L., & Rooney-Varga, J. N. (2015). WORLD CLIMATE: A role-play simulation of climate negotiations. *Simulation & Gaming, 46*(3–4), 348–382. https://doi.org/10.1177/1046878113514935

Stewart, L. P. (1992). Ethical issues in postexperimental and postexperiential debriefing. *Simulation & Gaming, 23*(2), 196–211. https://doi.org/10.1177/1046878192232007

Strachan, D. (2007). *Making questions work: A guide to what and how to ask for facilitators, consultants, managers, coaches, and educators*. Jossey-Bass.

Teach, R. D. (1990). Profits: The false prophet in business gaming. *Simulation & Gaming, 21*(1), 12–26. https://doi.org/10.1177/1046878190211002

Teach, R. (2018). Why is learning so difficult to measure when "playing" simulations? *Developments in Business Simulation and Experiential Learning, 45*, 9.

Team Development: The Power of Debriefing. (2019, October 3). SHRM. https://www.shrm.org/executive/resources/people-strategy-journal/spring2018/pages/debriefing.aspx

Thatcher, D. C. (1990). Promoting learning through games and simulations. *Simulation & Gaming, 21*(3), 262–273. https://doi.org/10.1177/1046878190213005

Thatcher, D. C., & Robinson, M. J. (1990a). Me—The slow learner and some of its implications. *Simulation & Gaming, 21*(3), 303–314. https://doi.org/10.1177/1046878190213009

Thatcher, D. C., & Robinson, M. J. (1990b). Me—The slow learner: Reflections eight years on from its original design. *Simulation & Gaming, 21*(3), 291–302. https://doi.org/10.1177/1046878190213008

Thiagarajan, S. (1992). Using games for debriefing. *Simulation & Gaming, 23*(2), 161–173. https://doi.org/10.1177/1046878192232004

Thiagrajan, S. (1995). *Diversity simulation games* (pp. 6—7). HRD Press.

Tipton, E., Leigh, E., Kriz, W., & Crookall, D. (2016). The real learning begins when the game stops. In T. Kaneda, Y. Toyoda, & P. Rizzi (Eds.), *Simulation and gaming in the network society* (p. 473). Springer.

Ulrich, M. (1997). Links between experiential learning and simulation & gaming. In J. Geurts, C. Joldersma, E. Roelofs (Eds.), *Gaming/simulation for policy development and organizational change* (pp. 269–275).

Upasen, R., & Thanasilp, S. (2020). Death acceptance from a Thai Buddhist perspective: A qualitative study. *European Journal of Oncology Nursing, 49*, 101833. https://doi.org/10.1016/j.ejon.2020.101833

van Dalen, A. S. H. M., van Haperen, M., Swinkels, J. A., Grantcharov, T. P., & Schijven, M. P. (2021). Development of a model for video-assisted postoperative team debriefing. *Journal of Surgical Research, 257*, 625–635. https://doi.org/10.1016/j.jss.2020.07.065

van Ments, M. (1999). *Effective use of role play*. Kogan Page. https://www.koganpage.com/product/effective-use-of-role-play-9780749427993

Verkuyl, M., Lapum, J. L., Hughes, M., McCulloch, T., Liu, L., Mastrilli, P., Romaniuk, D., & Betts, L. (2018). Virtual gaming simulation: Exploring self-debriefing, virtual debriefing, and in-person debriefing. *Clinical Simulation in Nursing, 20*, 7–14. https://doi.org/10.1016/j.ecns.2018.04.006

Ward, M. D. (2009 & 2022). *Theories, models, and simulations in international relations: Essays and research in honor of Harold Guetzkow*. Routledge.

Wardaszko, M. (2018). Interdisciplinary approach to complexity in simulation game design and implementation. *Simulation and Gaming, 49*(3), 263–278. https://doi.org/10.1177/1046878118777809

Wardaszko, M., Meijer, S., Lukosch, H., Kanegae, H., Kriz, W. C., & Grzybowska-Brzezińska, M. (Eds.). (2021). *Simulation Gaming Through Times and Disciplines: 50th International Simulation and Gaming Association Conference, ISAGA 2019, Warsaw, Poland, August 26–30, 2019, Revised Selected Papers* (Vol. 11988). Springer International Publishing. https://doi.org/10.1007/978-3-030-72132-9

Wegerif, R. (2022). Beyond democracy: Education as design for dialogue. In *LiberalDemocratic education: A paradigm in crisis* (pp. 157–179). Brill mentis.

Wenger, E. (2008). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.

Whitton, N. (2011). Game engagement theory and adult learning. *Simulation & Gaming, 42*(5), 596–609. https://doi.org/10.1177/1046878110378587

Whitton, N., & Moseley, A. (2014). Deconstructing engagement: Rethinking involvement in learning. *Simulation & Gaming, 45*(4–5), 433–449. https://doi.org/10.1177/1046878114554755

Zhang, X. C., Lee, H., Rodriguez, C., Rudner, J., & Papanagnou, D. (2018). A novel approach to debriefing medical simulations: The six thinking hats. *Cureus*. https://doi.org/10.7759/cureus.2543

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Design Science Perspective on Formative Evaluation in Simulation Games

7

Marieke de Wijse-van Heeswijk and Willy C. Kriz

Overview

When employing simulation games, it is crucial from the intake phase onwards to consider the intended educational effects on the individual, group, and organisational levels; the game mechanics, facilitation, and reflection should be aligned to these educational purposes. A didactic approach can consistently be built into a simulation game, contributing to the learning outcomes. Formative assessment can be a useful tool as a leverage point for learning. The application of a didactic approach to a simulation game is also possible if educational goals are established on a meta-level (e.g., in open simulation games). However, pre-designed didactic approaches to enhance learning do not guarantee positive effects in practice; a design does not automatically generate intended outcomes. In simulation games, the combination of unique actors, contexts, and a technological system can generate a near-infinite variety of responses and outcomes. Nevertheless, consistent preparation of the design and facilitation approach on a meta-level can aid in generating learning opportunities for participants. The design, facilitation, and debriefing phases should be considered an interconnected learning system, where each phase contributes to the intended effects. The evaluation or goals of the simulation game should be built into the initial design to serve as an effective learning mechanism during the introduction, gameplay, reflection, and debriefing. In this manner, learning opportunities are built into the entire process; each step along the way can

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contribute to learning. This chapter is based on a meta-analytical view with a design science perspective on simulation game design, facilitation, active learning, and the role of formative assessment.

Keywords

Formative assessment · Simulation · Facilitation · Debriefing · Active learning

Learning Objectives

1. To describe the added value of formative assessment in learning from simulation games.
2. To describe the current state of research regarding formative assessment and simulation games.
3. To clarify the relationship between, and additive value of, formative and summative assessment in simulation games.
4. To clarify how the simulation model, evaluation model, and didactic model of simulation games interrelate in adding learning value to these games.
5. To explore how to apply formative assessment in simulation games in the diverse contexts described in case studies.

7.1 Introduction

Formative assessment has proven a successful approach for increasing educational effects and motivation in students (Barber et al., 2011; Bennett, 2011; Sadler, 1998). In simulation and gaming, formative assessment has not yet been fully recognised as a useful approach for enhancing the educational effects of simulation games. Various authors have supported the use of formative assessment in simulation games (Bellotti et al., 2013; Chin et al., 2009; Delacruz, 2010; Kickmeier-Rust et al., 2009; Kumar, 2018; McMullen et al., 2016; Plass et al., 2011; Shute et al., 2017). Some studies have used smaller games and game theory in specific areas of education, such as math (Delacruz, 2010; Hooshyar et al., 2016; Kumar, 2018; Tsai et al., 2015). However, the use of games in these studies differs from how simulation games are generally used in education, with a starting scenario, different roles, and constraints of rules and resources. Applications of formative assessment help to focus learning from the introduction onwards. Formative assessment is a form of evaluation that can inform both learners and facilitators about the learning statuses of game participants. In addition, formative assessment can fuel a community of practice whose members can continuously learn from the results, thus improving learning outcomes in different contexts. The contextualised knowledge that such assessment provides can increase the skills of facilitators and designers, as well as their understanding of how learning can be optimised in the context of simulation games. This does not rule out the added value of summative

or after-game assessment. Summative assessment can provide valuable information regarding educational outcomes, in addition to the information derived from formative assessment. Many approaches to summative assessment have been described; some can extract tacit knowledge. Later in this section, we provide an example of a longitudinal study reported by Kriz and Auchter (2016), and Kriz and Hense (2009) that combined both summative and formative assessments.

In contemporary simulation and gaming practice, it is not common practice yet to design formative assessments focused on learning during the simulation. Thus far, few publications have shown such practices (Nakamura, 2021; Van Laere & Lindblom, 2019). Nakamura added structured questions to the preparation and reflection phases, which helped participants to reflect on their approach, resulting in improved learning outcomes and a deeper understanding of the educational aims involved. In practice, designers often assume that the game directly delivers the results; the debriefing usually involves large groups of tired participants and the primary aim is to deliver the educational results. In case studies, we examined how formative assessments can aid learning in different types of simulation games. The case studies selected varied from rule-based to open simulation games (Klabbers, 2009) because learning occurs across the continuum, despite differences in focus. It is valuable to select a broad range of case studies because this approach allows examination of the potential added value of formative assessment in different types of games with different types of learning. In rule-based simulation games, learning is directed at known learning goals; these goals flow logically from the norms on which the rules are based. In a rule-based game, it is assumed that learning goals can be captured in norms and rules; thus, these norms and rules are built into the game model. Rule-based games are grounded in normative models, which assume that a correct answer to any type of question is possible and that learning goals can be captured in rules and norms. The ontology of open simulation games is based on a constructivist perspective (Kriz, 2010), which assumes that we cannot predict learning goals before the simulation. There are no absolute right answers; not all learning can be captured in norms and procedures (Christopher & Smith, 1990; Klabbers, 2000; Leigh & Spindler, 2004; Rodríguez-Aflecht et al., 2016). Learning in open simulation games involves learning outcomes that were unknown before the simulation game because of the messy, complex problems for which such games are designed. Instead, the learning outcomes emerge from the gameplay (Klabbers, 2000, 2009; Leigh & Spindler, 2005). Any type of simulation games can be positioned somewhere on the rule-based—open simulation games continuum.

Tsoukas (2017) advised the complexification of theory development because many potential factors and variables influence learning and change. It is important to investigate the impact and learning outcomes by applying formative assessment in different contexts. Furthermore, the application of formative assessment can be more challenging in computer-based simulation games because of the variety in learning. However, the ideas provided in the chapter regarding facilitation design (De Wijse, this book) for working with added reflective mechanisms outside the gameplay can add value here and in games with digital interfaces. Reflecting on the

use of a learning environment adds value from the perspective of second- and third-order learning, which can further clarify educational ideas and assumptions.

Leigh (2003a) proposed that people with a fixed mindset focused on rules and procedures can quickly turn an open simulation game into a rule-based game. Furthermore, sociological scholars such as Asbhy, Giddens, Luhmann, and Von Foerster have offered important insights relevant to the analyses of learning processes in simulation games. A deeper dive into this matter would exceed the scope of this chapter; thus, we will only briefly discuss these theories (for more information, see Klabbers, the *Magic Circle*, 2009; Achterbergh & Vriens, 2010). Von Foerster (Achterbergh & Vriens, 2010; Daniel & Daniel, 2018; Von Foerster, 1984) describes how any type of system (e.g., social, technological, or something in between) has unique behaviours because it interacts as a unique system with a unique environment. This unique behaviour is known as 'Eigen behaviour', whereby system behaviour considerably changes if a single person, factor, or variable is added, changed, or removed from the system.

In contrast, an interpretation of Luhmanns' thoughts by Achterbergh and Vriens (2010) suggested that systems gain unique stability because each system's structure is enacted by the expectations of its inhabitants. Achterbergh and Vriens interpret how Luhmanns theory on expectancies is applicable to how organisational culture is created and continuously changed in a concurrent manner. However, significant pressure towards system stability emerges from the expectations of people in the system, who want to maintain the status quo. Tsoukas and Chia (2002) proposed that any social system is in a constant state of flux because of continuous small adaptations towards and away from expectations. De Sitter and Giddens noted that the social and technological components of the system are interlinked and influence each other. The constraints of the system generate and amplify certain types of behaviour. For instance, a bureaucratic structure (Simon, 1997) can generate alienation and demotivation because of rigidity regarding rules in the system.

What can we derive from these findings as facilitators and designers of learning environments that employ simulation games? Overall, systems are unique (Achterbergh & Vriens, 2010; Bausch, 2000; Elder-Vass, 2007; Sewell, 1992; Sitter, 1981; Tsoukas & Chia, 2002) and in constant flux, yet surprisingly stable and sometimes rigid, although many factors influence each system. Thus, if we presume that we know in advance what participants will learn and that we can always measure this information via summative evaluation, we are likely to overlook crucial learning and might capture the wrong learning outcomes. Therefore, relying solely on summative evaluation is risky and can lead to both unreliable and invalid outcomes. We will explore this point in greater depth in the case studies below.

Simulation games always use an abstraction of reality, and complexity is always present (Bekebrede et al., 2015; Duke, 2014; Geurts et al., 2000; Klabbers, 2009; Lukosch et al., 2018; Raghothama, 2017; Wardaszko, 2019). This complexity arises from the schemata or presumptions and pre-knowledge that participants bring to the game and the interpretations that arise during gameplay. The inherent complexity of simulation games can be an advantage because it often resembles our reality.

Nonetheless, we aim to learn something; this learning requires accurate, timely, and concrete feedback (Dieckmann et al., 2012; Eppich et al., 2018; Kichmeier-Rust et al., 2008; Salas et al., 2009; Seeber, 2019). The shaping of formative assessment in simulation gaming and the resulting practical outcomes have not yet been studied; thus, it is appropriate to examine these questions through several case studies. In a case study approach, a constructivist and systemic perspective can generate insight because each simulation game session has unique properties; the interconnected actors within the technology (whether analogue or digital) of the game generate the outcome together. Therefore, this chapter is the first attempt to construct theory and offer contextualised knowledge via case studies, despite the absence of a meta theory that can be applied across various simulation game types.

Analytical science and design science can be combined in this approach (Klabbers, 2018) through both formative and summative assessments. Analytical science refers to observing and measuring actual behaviour, whereas design science refers to understanding how behaviour can be influenced from a design perspective. The game as designed and intended can differ from the game as executed and facilitated. Formative assessment mechanics designed into the gameplay and reflections can serve as vehicles for bringing congruence to the design (design science) and outcome (analytical science). Bridging the gap between the two types of science can elevate the understanding and development of contextualised knowledge regarding the use and outcomes of simulation games in practice.

7.2 Research Gaps

Considering that limited theory development and empirical research regarding games and the role of formative assessment are thus far available (Nakamura, 2021; Van Laere & Lindblom, 2019; de Wijse, 2021; also see Chap. 4), we find it insightful to pursue further research concerning the question of what formative assessment techniques can contribute to learning in simulation games. Some research has explored how basic mechanisms such as feedback (i.e., a formative assessment technique) influence learning and motivation (Bedwell et al., 2012; Deen, 2015; Harteveld, 2011; Ke, 2016; Tieben, 2015; Watt & Smith, 2021; Wilson et al., 2008). However, specific research concerning the formative assessment of effects and outcomes and facilitated interventions is generally missing in simulation games research. Furthermore, the scarce research regarding the long-term effects of approaches with facilitated formative assessment during gameplay is limited to a few studies with specific math games or smaller games such as tic-tac-toe (Tsai et al., 2015). Kriz and Auchter (2016) have provided an intriguing longitudinal research approach, in which they study the effects of an entrepreneurial game in terms of the number of participants who subsequently became entrepreneurs. They also extensively considered the effects of facilitation approaches in the gameplay and provided sufficient insight to argue that specific research concerning different

facilitation approaches in learning requires greater attention. At this point, there is a need for caution to avoid overgeneralisations, considering that (as mentioned previously) games are socio-technical systems. They have also been described as non-trivial machines by Klabbers (2009) and Van Den Hoogen et al. (2015), who noted that it is difficult to determine the outcomes of a socio-technical system. However, on the basis of more than 40 years of experience with simulation games and many case studies, we can extract some general principles that are applicable to a wide variety of simulation games focused on learning. Since the publication of works by Wilson et al. (2008) and Mayer et al. (2014) regarding evaluation methodology for simulation games, no substantial practice-oriented research has been added to evaluation via formative assessment during gameplay. We lack an overarching methodology for research concerning the effects of formative assessment because contexts differ.

7.3 Making Sense of Evaluation and the Relationship with Learning in and from Simulation Games: Formative and Summative Assessment

Evaluation can be conducted in a formative or summative assessment mode (Bell et al., 2001; Bennett, 2011; Dolin et al., 2018; Harlen & James, 1997). Formative assessment can comprise several types of measurement, including evaluation during gameplay with the aim of helping participants to learn (Nakamura, 2021). Formative assessment can also be part of a learning cycle in the development phase of a simulation game (e.g., in test groups), or in evaluating the effects in a university curriculum or in the community of the practice of particular games (e.g., to optimise the game and use it to train facilitators). The literature offers various formative assessment measures for use during and after simulation gaming (Delacruz, 2010; Hooshyar et al., 2016; Kumar, 2018; Tsai et al., 2015). Ideally, to assess learning effects, a null measurement is conducted before the introduction and gameplay. In addition, behavioural observations and knowledge assessment—including the acquisition of participants' reflections and considerations during gameplay and timeout—add value when assessing participant development. However, any type of measurement method can influence learning, potentially creating a positive influence on learning (e.g., by evoking additional reflection loops) or a negative impact by disrupting the game flow and immersion (e.g., when participants must fill out questionnaires that are unrelated to what they find meaningful during gameplay). Fortunately, there are numerous methods to prevent interruptions and incorporate smart approaches to measure learning and behaviour that are non-intrusive.

Summative assessment often consists of a pre- and post-game measurement; it can deliver information about what participants learned from the gameplay. This information is valuable because it allows the effects of the simulation game to be measured 'in a proper manner' (Bellotti et al., 2013; Chin et al., 2009; Faizan et al., 2019; Feinstein & Cannon, 2002; Mayer et al., 2014; Petri et al., 2016; Petri & von

Wangenheim, 2016), considering influential factors. This is crucial because valuable information about learning effects can easily be missed because of factors such as the evaluation method, debriefing setup, readiness and motivation of the participants to engage in the debriefing, and the ongoing meaning-making processes during debriefing (Roungas et al., 2016). For various reasons, participants may not feel actively involved in the debriefing and evaluation; these reasons include questions that do not match their experiences in the gameplay, a few people who dominate the discussion, and disconnection from the learning goals. Insufficient debriefing in which a facilitator does not gather correct gameplay data could be both unethical and dangerous, because participants may leave the simulation with the wrong conclusions (Kriz et al., 2019). In addition, as explained before we cannot precisely predict what lessons participants will have acquired from the gameplay (de Wijse-van Heeswijk, 2021; Kriz, 2010; Schwägele et al., 2021; van Laere et al., 2021). In summary, participants' learning processes involve considerable complexity; it is crucial that the facilitation design aids participants in learning effectively from the gameplay and provides formative feedback regarding their functioning to fuel their learning processes (Alklind Taylor, 2014; Deen, 2015; Watt & Smith, 2021; Wilson et al., 2008).

7.3.1 Challenges in Finding Learning Effects Using Formative and Summative Evaluation

Ideally, to identify learning effects, a null measurement is conducted before the introduction and gameplay. This initial measurement can contribute to participants' learning processes by clarifying their starting position and how this position relates to their learning goals. More challenging issues arise during the measurement of effects after gameplay.

Participants' answers may be influenced by whether they experienced the gameplay as positive, negative, or somewhere in between. The game flow might not have met their expectations; the questions asked might not address their learning or their concerns. In addition to fidelity and validity concerns that may arise regarding how participants experienced the gameplay, the reliabilities of the answers are sometimes questioned. Because learning processes continue after gameplay, a repeated questionnaire administered 10 days after gameplay might render a different view of learning and the gameplay process, particularly because sufficient emotion processing requires time to allow a more reflective assessment of the gameplay. To counter bias, a method for measuring the impact of simulation games was proposed by Dr. Peters (long-time ISAGA member, former chair of SAGANET) at a Hex session (a well-known simulation game developed by Prof. Richard Duke) at Radboud University (Nijmegen, The Netherlands) in 2004. Before gameplay, Dr. Peters had his students write 5–10 words describing their expectations about the game session and what they expected to learn. He repeated this after the gameplay by simply providing a plain sheet of white paper. Although the students thought this was a strange exercise, they were surprised when they received both sheets back

(Dr. Peters had collected the first sheets and only returned them after the second sheet was completed). The results showed the students that they had learned much more than they expected; because they had already incorporated their learning into their schemata, they had not recognised it as new learning. It was also possible to discern the type of learning taking place and at least some of the detail. This may provide a powerful method to measure learning without the bias of guided questions. Nowadays this method is further elaborated as concept mapping (de Ries et al., 2021; Palmunen, 2021). One method to measure learning during gameplay involves the application of a qualitative coding scheme to the type of learning that happens during gameplay. An experienced facilitator and/or coder can rapidly discern the type of ongoing learning and relate this to the learning goals. For instance, if the goal is to learn how to apply a procedure, a coding scheme can be developed for that specific procedure. If the learning goal is related to a meta-skill such as system competence, this term can be separated into specific types of behaviour that can be observed during gameplay. These methods have a low threshold for application and do not require an extensive academic background in evaluation.

Because simulation games are social systems, a systemic approach to learning is suitable for learning measurement. In an article concerning evaluations of simulation games, Peters et al. (2014) briefly discussed the why, what, and how of such evaluations; they provided an example of how learning can be measured using Kirkpatrick's transfer of learning levels: reaction (satisfaction or happiness), learning (knowledge or skill acquired), behaviour (transfer of learning to workplace), results (transfer or impact on society), and (in later versions) the monetary component of return on investment (Petri & von Wangenheim, 2016). In this chapter, we more deeply consider the levels that define the type of learning using a theory proposed by Argyris, which is considered relevant for social systems over a range of scientific disciplines; it has been previously applied to simulation games (Fazey et al., 2018; Gugerell & Zuidema, 2017; Mayer et al., 2014), as well as individual and organisational learning (Kim, 1993). Argyris (1976, 2004) is the founder of social learning systems theory, which is useful for identifying what people have learned from a simulation game and understanding the level at which such learning has occurred. Argyris (1982) describes first-order learning as the type of learning in which a participant can apply certain norms in specific situations. Second-order learning involves knowing when to apply specific norms. For instance, in a simulation game, a participant may notice that applying norms is no longer sufficient and another type of process is necessary to meet the challenge. The participant decides, for instance, that another department must be involved in solving the challenge. Third-order learning, a later addition to Argyris' learning loop theory (Tosey et al., 2012; Visser, 2007), consists of learning to learn and viewing the learning challenge from a meta-perspective—for example, seeing whether the management of a specific challenge adds value to the organisation and its employees (Tosey et al., 2012).

This systemic approach to learning measurement can be tailored to the learning goals of the simulation game. If the goal is to train a specific procedure or the application of a standard norm, measurement of first-order learning is sufficient. When a training also contains learning challenges that involve process application

(e.g., team management or department management training), the measurement can examine both first- and second-order learning. When the aim of the simulation game is to teach the development of strategy and test policy, or an organisational development issue such as cultural and structural change, the measurement should consider third-order (meta) learning. This consideration elicits a philosophical and ethical discussion of whether third-order learning is always necessary and whether individuals should always consider the larger context when determining which norm to apply and how to apply it. In the complex society in which we now live, we may wonder whether the goal of first-order learning alone can attend to the needs of the twenty-first century, where change happens with such speed that norms must be recalibrated with reality before they become standardised. The OECD Directorate for Education and Skills has developed a competency model for twenty-first century learning skills, where components such as well-being, agency, and sustainability are the main pillars for learning in contemporary society and in the future.[1]

Also, Teo (2019) has elaborated on what skills teachers and students need in the twenty-first century and how this applies to a need for dialogue between teachers and students in co-creating knowledge. We leave this particular discussion and refer readers to Chap. (10) of the book by Achterbergh and Vriens (2010) for information about doing the right things for the right reasons to achieve sustainable survival for both individuals and organisations.

It is important to realise that any type of assessment method and its specific context can influence learning; for instance, it may cause an extra reflection loop that has a positive influence on learning or may disrupt the game flow and participant immersion by requiring them to complete questionnaires that are unrelated to what they find meaningful during gameplay. In practice, there are numerous methods to prevent interruptions and to incorporate immersive mechanics for non-intrusive measurements of learning and behaviour. Often, these methods consist of mechanics that enhance learning and concurrently inform the learner and facilitator of learning developments. For instance, participants can maintain a decision log in which they build argumentation for their decisions. They submit this log after each game round to enable to the facilitator to enter their decision into the game system and provide feedback regarding the effects of these decisions. Also for instance in practice, gathering data in the form of summative assessment after gameplay, when participants are sometimes exhausted and want to leave, can be difficult and misleading because participants often exhibit low motivation or are incapable of providing correct information. Participants in educational systems are often dependent on the organisation conducting the simulation game for diplomas and grades; thus, there may be a tendency to judge the game results more positively to avoid the perception of incompetence. In addition, participants are often not consciously aware of what they learned from a particular game because this knowledge has already become embodied (Harteveld et al., 2009; Klabbers, 2009; Nesbit, 2012). More examples can be easily gathered but we want to point out each form of measurement should always be considered in context to obtain a more optimal learning result.

[1] OECD_Learning_Compass_2030_concept_note.pdf.

7.3.2 Using Formative Assessment to Enhance Learning During Gameplay and Find Learning Effects

Formative assessment has been gaining popularity in the past decade (Bennett, 2011; Hattie et al., 1996; Tsai et al., 2015). Performance feedback is an important basis for (experimental) learning in simulation games for both participants and facilitators (Alklind Taylor et al., 2012; Hamdaoui et al., 2018; Kolb & Kolb, 2009; Willcoxson & Prosser, 1996). Such learning is the specific aim of formative assessment: formative assessment is intended to enhance learning and offer learners' feedback concerning their performance that can be used in subsequent gameplay. For facilitators and game designers, formative assessment can deliver information regarding the learning impact of the game and clarify whether this impact is congruent with the aims of the game. Based on the outcomes of the formative assessment, both the game and the facilitation approach can be improved. This improvement allows learners and facilitators to optimise the learning opportunities afforded by game simulations such as experimentation, reflection, and learning; it also helps to formulate new plans and ideas. Formative assessment enables facilitators to be responsive to learning and optimise challenges via behavioural observations and game mechanics. Examples include built-in audits that provide information regarding participants' learning statuses during gameplay or a timeout reflection where questions about proceedings could provide insight into participants' learning paths. The facilitator can design a formative learning approach to track the participants' learning developments and adapt the approach according to specific learning needs and aims. Information about gameplay learning can fuel learning during gameplay reflections or timeout, as well as debriefing (Klabbers, 2000; van Laere & Lindblom, 2019). Facilitators can also learn from these results because they provide information about the ongoing learning processes in the simulation game.

Designers should also ensure that the type and frequency of feedback from formative assessment are appropriate specifically for each game context; this avoids problems such as the risk of creating cognitive overload (Feldon et al., 2019; Ginns & Leppink, 2019) or unconscious suggestions of inaccurate learning conclusions. Considering that research regarding the effects of rewards and feedback is limited, combined with the context specificity of simulation games as socio-technical systems (Bekebrede et al., 2015; Raghothama, 2017), an experimental evaluative approach is necessary to study and learn from various applications of formative assessments in simulation games, particularly depending on participant traits (e.g., gender, motivation, and self-efficacy). Research from simulation games in math and science (Delacruz, 2010) and longitudinal research by Kriz and Auchter (2016) strongly indicate that different groups of participants respond in a distinct manner to formative feedback.

Recently, there has been an increase in academic attention to measuring the effects of formative assessment, which is a notable challenge because of many factors that might interfere with the learning results (e.g., population characteristics, context characteristics, personal characteristics, and the sense of urgency/motivation for learning). Some review studies concerning learning mechanics have included

research related to feedback in simulation games (Bedwell et al., 2012; Vlachopoulos & Makri, 2017; Watt & Smith, 2021). This formative method of assessing performance may provide a fairer approach to learning measurement, as well as an opportunity to measure learning capacity because it allows the calculation of learning curve steepness. A learning capacity curve might also render a more reliable learning outcome, compared with static measurement of post-game learning; for instance, in multiple game rounds, participants can demonstrate their development potential by adaptively responding to changing demands. This is relevant for the type of learning that is currently expected by organisations; see www.oecd.org and the departure speech of Prof. Geurts of Tilburg University (2015).

7.4 Case Studies/Previous Research

In this section, we examine three different case studies. In Sect. 7.4.1, we introduce a case study concerning combinations of formative and summative assessments in Sect. 7.4.2, we provide a short description of a negative application of summative assessment in management games by Prof. Teach. In Sect. 7.4.3, the simulation game Hex is used in a politically sensitive context, and formative assessment is applied to create learning safety and experimentation. Section 7.4.4 presents a case study of an open policy game in a Dutch city council, where a policy game was used to generate adaptive change. Here, formative assessment enabled participants to learn from each other and from the gameplay. Because of the open structure, participants were not distracted by numbers, figures, or procedures that did not match reality. Participants and facilitators together generated a realistic learning environment in which the feedback they received and evaluated led to the enhancement of the learning process.

7.4.1 Case Study of Formative and Summative Assessment in a Well-Known Management Game for Enhancing the Simulation Game and the Learning Outcome

Summative assessment combined with formative assessment can deliver optimal insights into why participants learned what they learned. Using both techniques while considering contextual factors can also help researchers to develop insights concerning where and how to adapt the simulation, facilitation, and/or debriefing to optimise results. To illustrate this, we describe some findings from the simulation game-based EPC program.

Context Information for the Case Study

From 2007 to 2012, Kriz and Auchter (2016) performed a series of evaluation studies in which nearly 8200 students participated in more than 300 ‘EXIST priME Cup’ (EPC) seminars. The annually organised EPC entrepreneurship training

program was conducted together with approximately 150 universities and 30 leading companies, under the auspices of the German Federal Ministry of Economics and Technology. The EPC program had four levels. The Campus Cup-level teams competed within their university. The best two teams at each university were allowed to enter the next level, the Master Cup, in which teams from different universities competed. The two winning teams from each Master Cup entered the next level, the Professional Cup. The final level was the Champions Cup, in which the best student teams competed to win the German national championship. In 2014–2016, additional studies were performed to examine the long-term learning effects of these games. The studies were conducted to determine whether the simulation game-based educational entrepreneurship programs reached their goals, which included fostering participants' entrepreneurial competencies and desire to create a start-up.

As Fig. 7.1 shows, data collection for the accompanying evaluation studies was conducted in several steps. At the Campus Cup level (A), three assessments were performed: before (1), during (2), and after (3) the gameplay and debriefing (to measure the input, process, and outcome variables of the evaluation model; see below). At the Master Cup (B), Professional Cup (C), and Champions Cup (D) levels, the data were collected after the gameplay and debriefing. All evaluation studies (A to D) were conducted over the time span of almost 1 year. Additional measurements were also performed (E) 3–5 years later to study long-term effects. Participants who only completed the Campus Cup had four data collection points; students who participated in the final Champions Cup had seven data collection points. Because we used the same data-gathering process in each of the 6 years of the EPC program, 42 steps of assessment were involved in the formative evaluation of the entire program.

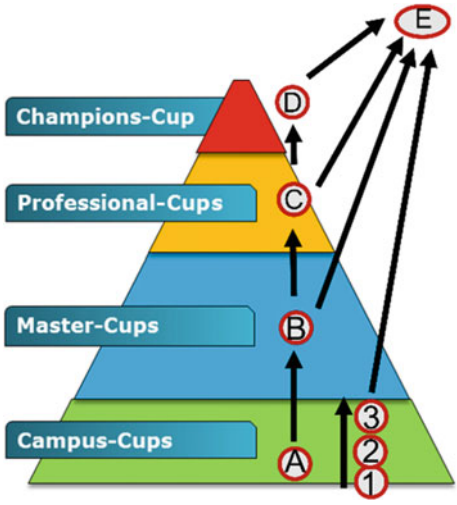

Fig. 7.1 Structure of the simulation game-based EPC program and data collection

Evaluation Approach and Formative Data Collection

The summative approach addresses the simulation game's effectiveness as a tool for education and therefore considers the assessment results in the form of self-report questionnaires completed by students who participated after the gameplay. The purely summative output-oriented approach shows the students' subjective assessment of educational tool effectiveness. In this approach, students rated their acceptance of the simulation game; they also rated their learning experience, the motivational effects they experienced, and their overall satisfaction with their participation in the game. The assessment used in this case study consisted of questionnaires after the debriefing stage; this approach was also used in the EPC studies (Kriz et al., 2008). However, this approach alone does not investigate the specific conditions and factors that make a simulation game an effective learning tool (Hense et al., 2009). Additionally, an evaluation approach has formative aims. In this specific example, the formative evaluation intended to contribute to the overall optimisation and quality of learning in the EPC program by continuously improving the games used, as well as their facilitation and debriefing. To enable formative assessment, a logic model based on theory and research was developed (see also Kriz & Hense, 2006). The central thesis of the theory-oriented approach was that evaluations should be based on a logic model. The logic model explains how the interaction of a program, its participants, and its environment is expected to elicit the program's desired outcomes. When simulation games are used as learning tools, this 'logic model' must be based on theoretical assumptions and empirical evidence derived from learning psychology, education, and gaming simulation research and theory. The learning model should also describe how the simulation's features, learner characteristics, and context conditions interact to generate its intended learning outcomes (Hense & Kriz, 2008). Logic models typically consist of several variables that are relevant in the context of the evaluated program and state their mutual relationships. Usually, at least three types of variables are captured in a logic model: antecedent variables (input), variables related to program activities (process), and variables related to program effects (outcomes). Because this model provides a framework for the interpretation of events during simulation games, all factors in the logic model must be measured. In the EPC program, questionnaires, tests, and interviews involving participants (students) and facilitators were used.

As Fig. 7.2 shows, input variables such as socio-demographic data, social skills and attitudes, personality traits, entrepreneurial attitudes, experience in teamwork, and experience with simulation games were collected through questionnaires during the Campus Cups. Pre-skills (e.g., business knowledge and qualities needed to develop business plans) were tested in exam-like performance tasks. The same variables were also collected during the Campus Cups and the subsequent Master, Professional, and Champions Cups as output variables in the post-game assessments using questionnaires and tests. In addition, motivational variables and acceptance of the simulation game (including briefing, gameplay, facilitators, and debriefing) were investigated through questionnaires in all Cup levels. In the

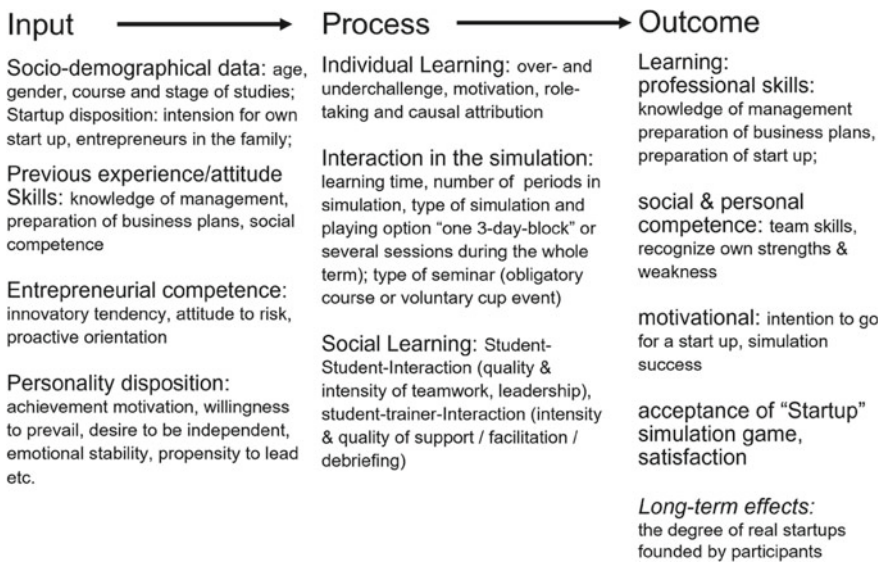

Fig. 7.2 Logic model (evaluation model) of the simulation game-based EPC program

Campus Cup, process variables were also collected during facilitation and gameplay (e.g., individual learning, group dynamics, participant–facilitator interaction, facilitator behavioural gameplay and debriefing, interaction, and engagement with the simulation game, and motivational variables) through questionnaires.

In addition to these extensive quantitative instruments, qualitative interviews were performed with selected students and facilitators at all Cups to obtain deeper insights into the interconnections and processes, then gather ideas for improvements. The regular debriefings were evaluated after each gameplay; periodic meta-debriefings (see below) were conducted with facilitators, jury members, and game designers. At the end of each year, a conference was organised where all results were discussed; suggested changes and a written report were generated for the sponsor (Ministry of Economics and Technology). In the long-term study, the main variables were again measured retrospectively through questionnaires; the rates, sizes, and forms of the participants' real-life start-up businesses were explored.

Evaluation as an Interconnected Component in the Gaming Simulation Process

Figure 7.3 illustrates gaming simulation as a process (Kriz, 2003, 2011). In the first step, an element of reality is selected as a reference for the design of simulation game artefacts. Here, a specific case situation was chosen and transferred into a specific game scenario. The simulation game is designed as a (reduced and abstract) dynamic model of reality. In the design part of the process, a simulation model is created. This model defines the relationships among the system elements and gaming elements. In the example of the EPC program, existing start-up business

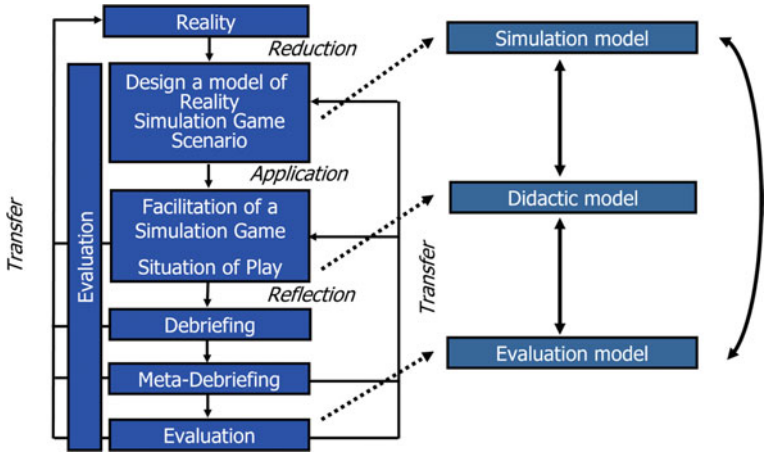

Fig. 7.3 Process of gaming simulation (based on Kriz, 2003, 2011)

simulation games were selected; distinct customised scenarios were created within these simulation models. Based on the formative evaluation process and the results of each gameplay round, changes were made: for example, different (and new) simulation games were created and used at specific Cup levels; the underlying simulation models and scenarios were replaced, extended, or optimised.

In the second step of the gaming process, a designed game is applied through play by participants and facilitation by facilitators (e.g., trainers and teachers). Playing the game involves the use of a game artefact (form) to simulate systems processes (functions) of the simulation model. Furthermore, a debriefing is conducted to enhance the learning process through reflection, to apply and discuss newly gained insights, knowledge, and skills. Here, the transfer is supported to encourage players to reflect further on the linkages between the game and reality. In this part of the process, known as facilitation and debriefing, a didactic model is applied. This didactic model defines how the game will be used with a specific target group and within a specific learning or organisational context. In the example of the EPC program, different facilitators (e.g., more female facilitators and jury members as role models) and different didactic elements (e.g., extended time for debriefing, as well as additional and changed facilitation and debriefing methods) were implemented.

In the next step of the gaming process, referred to as meta-debriefing and evaluation, an evaluation model is applied. In meta-debriefing, the evaluators, game designers, facilitators, and other stakeholders reflect on the immediate results and discuss the feedback derived from the evaluation studies. The evaluation model helps to focus on the combination of summative and formative approaches; it also defines how the potential effects of the game will be investigated, as well as how and why the game works in specific contexts (see above). Through a rigorous discussion of the evaluation results after each iteration loop of an educational

program, the program itself can be improved. In the example of the EPC program, the evaluation results led to major changes; the effects showed continuous improvement. In general, the evaluation results in the EPC program were strongly positive. Notably, several years after participation, the students assessed their long-term learning positively. Former students of the game-based cup competition opened significantly more start-ups, compared with peers who did not participate in the simulation games. For detailed results, see Kriz and Auchter (2016). Here, we mainly focus on the EPC program as an example of the evaluation approach.

As an example, within the EPC evaluation process, we briefly discuss here some of the gender effects found in the evaluation studies (Auchter & Kriz, 2013). In contrast to the program's intentions to increase entrepreneurial motivation, the analysis revealed reduced motivation among female participants. Compared with their male peers, women had better knowledge of business administration and created better business plans both before and after the simulation; however, the predisposition to start a business was significantly less among women than among men, both before and after the simulation. Compared with men, women demonstrated less inclination to take risks; their willingness to take a leadership role in the simulation games was also less pronounced. Additionally, they felt more overburdened during the simulation, took fewer leadership roles, and reported lower motivation. However, specific gender stereotypes contributed to these outcomes. Regardless of the simulation, women were less inclined to start a business; this likely made them less able to place themselves in entrepreneur roles. Therefore, they were less motivated by the game experience than were the male participants.

The formative evaluation and meta-debriefing led to a test scenario in which three special seminars were conducted for women only. Furthermore, the male facilitators were replaced with female facilitators. Additionally, a board-based simulation game (same learning goals and simulated variables, but as a board game instead of a digital computer-assisted game) was applied. The debriefing was also modified in response to the interviews conducted. The interview results showed that women were more content-oriented (learning from the game), whereas men were more competition-oriented (winning the game) (Auchter & Kriz, 2013). Women explained that they would like to receive more feedback regarding their strengths and weaknesses; they desired a more detailed discussion of the game results. The extended debriefing process was likely responsible for significantly better assessment outcomes, compared with the traditional mixed-gender cups.

These findings demonstrate how the evaluation and adaptation of simulation games, as well as the facilitation of gameplay and debriefing settings, can diminish negative effects and help to reach the desired learning outcomes. The introduction of board-based simulations and extended debriefing sessions for the women-only seminars resulted in significant reductions in gender differences and improved learning; it also led to higher motivation and desire to launch start-up businesses. Several design aspects of the special test games were later included in the regular EPC program game scenarios, facilitation, and debriefing methods. The positive effects for women were extended; in the mixed-gender program, these changes based on the women-only gameplays had no negative impact on the participating

male students. Through the insights gained in the formative evaluation process, it was possible to implement significant optimisations with benefits for both male and female students. The results show the strengths of theory-based formative evaluation for improving educational measures. Such optimisation is the final aim of all efforts in the context of education and training. For example, the quality and intensity of the debriefing were improved; the evaluation led to the use of different game formats and program structures to support learning and increase the motivational effects of the simulation game.

7.4.2 Summative Assessment in Management Games by Prof. Teach, Georgia Institute of Technology, Atlanta

In the 1980s, several performance measures were applied to business games that focused entirely on the end scores of games, turnover, profits, and end states of organisational accountings (Teach, 1990, 1993). It was presumed that the highest-scoring teams learned the most during each game. Teach doubted the validity of this assumption and began to investigate what students actually learned during gameplay and how this influenced their final scores and overall learning. More accurate analysis showed that the highest-scoring teams were not learning the most during each game. Higher scores were caused by some random factors including the selection of a strongly performing market segment that allowed them a favourable start and sufficient resources for high achievement in the game. The teams in the middle range of game scores learned the most during each game, likely because they attempted different strategies, received feedback concerning their personal choices, and learned and adapted their strategies again. This outcome indicates the need to use caution when focusing on end results in summative assessment; formative assessment should be added during gameplay to support additional learning.

7.4.3 Case: Hex Gameplay Introduction for University Professors

In the summer of 2020, a Hex session was conducted at Radboud University, Nijmegen, The Netherlands. Participants included university professors who wanted to become acquainted with the use of simulation games in science education.

Hex, a haptic game that was developed as a policy game (focusing on a fictional underdeveloped country) in the 1960s by Richard Duke, was selected. The learning goals in the game were to establish policies and cooperate in such a manner that the country became prosperous. In multiple game rounds, the participants could make policy choices and cooperate at local, regional, and national levels to share resources and invest in a sustainable future. In this setting, summative assessment could not be used because the university faculty members did not have private

learning goals; they might have felt threatened if they perceived judgment on their performance and skill. Nevertheless, the game was required to provide sufficient challenge and feedback for the learners to experience meaningful gameplay (Bedwell et al., 2012; Kriz & Auchter, 2016). In this context, formative feedback enabled participants to play the game and improve their learning and strategies, creating a safe learning environment without excessive focus on the final outcome and possible negative outcomes of the gameplay. The formative assessment was designed to cover the entire process, from the preparation phase to reflection and debriefing.

First, the participants were allowed to prepare (first formative assessment tool) before the first game round. They set their learning goals as individuals and for the role of the group in which they were involved, then related their goals to their approach and plans in the game. The feedback from the first game round delivered them personalised information concerning whether their plans had been successful. After the first game round, a timeout (second formative assessment tool) was arranged by the facilitator to ensure that everyone understood their roles and to clarify any confusion about the game's rules and conditions. The facilitator asked three meta-level questions of the participants to enable the completion of questionnaires about their personal perspectives: 1. What went well? 2. What went less well? and 3. What do you need from yourself and from others to achieve your aims? The participants began working on the questions and had a 5-min mini-pre-briefing before the start of the next round; they aimed to encourage better cooperation by allowing information-sharing and responding to each other's requests.

During the second game round, the participants found that the cooperation they had agreed on was much harder than they initially expected because of insufficient oversight, as well as events that happened during gameplay. During the second timeout, when asked the same questions as before (what went well, what went less well, and what do you need from others/yourself?), they responded that they had become distracted by the 'noise' from the events of the game and that they needed to focus more on their targets. Their solution was to have more regular conversations between regional leaders, who would act as representatives to leaders at the national level. The player who represented the national level claimed that she had funding and wanted to help, but she was not receiving sustainable plans in which investments could be made. Another 5-min pre-briefing phase was added to enable participants to become better prepared for their cooperation tactics in the next game round. Plans were made and had been partially executed when the facilitator stopped the game. The facilitator explained that the game had been stopped at that point because of time limitations; this avoided causing the participants to not play realistic toward the end.

Participants had a short coffee break; they were then asked to reflect, in groups of three with a maximum mix of roles, about what had happened in the simulation and what they had learned (third formative assessment tool). They reflected on how difficult it was for them, considering their experiences and skills, to cooperate well in crisis situations and how immersive the experience had been for them. They reflected on how it was sometimes difficult to communicate with the other levels in

a manner that had impact and effectiveness; perspectives and information were sometimes missed despite the willingness to cooperate. They concluded that this type of learning intervention is suitable for students to gain experience in the complex reality of policy making and execution because it provides greater insights than theoretical approaches.

In the morning, some of the participants had expressed how they perceived the gameplay day as something they wanted to experience, although they did not trust it to work. At the end of the SG, they all expressed that they experienced much added value from the gameplay, and they saw that it has much added value to include SGs into the curriculum because of the unique learning opportunities the SG offered. Students can develop their schemata and gain experience in a safe learning environment that allows them to experiment with theory and test their assumptions. The two experienced facilitators had gradually adapted their approaches (developed by playing the Hex simulation more than 40 times over a period of 5 years) because they noticed that otherwise, the participants would learn little from Hex and would simply experience chaos. Therefore, the facilitators brought more focus to the reflection by inventing a follow-up timeout reflection, offering participants a focused view of their learning goals; this weaved a trail of experiences towards the participants' aims. Notably, the timeout reflections were formative assessments because both the participants and the facilitators checked on the experiences, performances, and lessons of the gameplay; their subsequent reflections and learning input from the guided questions provided guidance in the discussion while adding a short reflection with pre planning of their actions before the next game round.

In this case study, at least three formative assessment tools were applied:

1. A pre-planning phase concerning learning goals related to the game's goals at individual and group levels.
2. A series of reflection timeouts that built on chronological learning experiences.
3. Debriefings, initially in maximally mixed subgroups, to extract lessons at personal and group levels.

7.4.4 Free-Form Policy Game Case Study: City Council Policy Game for Adaptive Change

A large city council requested a policy game simulation because other change interventions had not been successful. Departments and their workers appeared to feel no urgency about adhering to policy changes requested by the management; the city council knew that a large budget cut was coming soon if changes were not made. In addition, considerable dissatisfaction in the organisation had been expressed because of the perceived erratic behaviour of department leaders in making individual budget decisions that had allocated funds very differently to various departments. A referent group was gathered with knowledgeable and experienced people from the organisation who would be involved in the change. They were deliberately selected for their diversity; some experienced a sense of

urgency, whereas others did not. This group of eight represented stakeholder groups in the organisation. The referent group provided information for use in constructing the game model. A smaller group of three, led by an experienced game developer and facilitator, composed a policy simulation. The process of assembling this referent group to provide input was intended to mobilise people from the organisation to participate in the change, and to learn with them (in the design process) about the challenges that the policy change would provoke. A metaphor was chosen to enlarge learning safety and provide a fresh perspective concerning the approaching problem. The city council's aim was to gain insight into what would happen in the future and to find tools to manage that future. Before the game began, an elaborate 'phase zero' was inserted to enable all participants to read about their roles, ask questions, form teams, and engage in pre-planning for their ambitions in the game. In between phases, gameplay participants had timeouts to reflect on what happened during gameplay. Furthermore, participants were asked about what went well and less well, and what they needed from others and themselves to achieve their goals. The facilitators allowed the participants to reflect in their role groups and then engage in a plenary sharing of their findings; this plenary sharing was followed by a facilitated discussion about how to proceed. The timeout reflection served as a formative assessment tool.

The findings showed that the manner in which the participants conducted meetings and made decisions was not adequate for adaptive change; a crisis would set in if they proceeded in this same manner. From the beginning, participants recognised the need for questions concerning how they would meet and how they should prepare before meeting by sharing information with others. The formative reflection enabled a chronological accumulation of learning experiences. After round 3, participants began to realise that they had to delegate some decisions to a group that would meet at the highest level; cooperation and timely information sharing would be essential for these groups to have sufficient information to negotiate decisions. This is an example of how creating an overview with participants about the outcomes of their behaviour can focus their future experiments in the gameplay to render formative feedback that proves insightful for facilitators and participants. The policy game was used as a tool for learning. Although the actual learning aims were initially on a meta-level, they became more precise during the gameplay and provided support for practical changes. The structured reflection timeouts served as effective formative learning tools. The long-term outcome was a shared commitment to change. Project teams were formed along with a new approach for communication and decision-making among the involved departments. The word 'collectivity', which had been a negatively charged political word, was used more often in meetings as the word that summarised what they had learned from the policy game.

In this case study, at least four formative assessment tools were applied:

1. Predesign with a referent group.
2. The referent group comprised members of the client organisation who learned from the analysis phase of the game design and worked with the designers to

align the abstract model to the didactic and evaluation models. They discussed and provided input from their organisational culture concerning how they perceived the learning goals in the organisation; they pre-designed the methods by which the game results could be used and incorporated in their follow-up activities.
3. Phase 0 (preparation on roles, teambuilding, checking on what was expected of them with reflection in terms of learning and their position in the game).
4. A pre-planning phase regarding learning goals that were related to the game goals on individual and group levels.
5. Guided reflection timeouts.
6. A series of reflection timeouts that built chronologically on learning experiences.
7. Summarising debriefing on the game process and the timeouts.
8. A debriefing for extracting lessons on personal and group levels and making the transfer to reality. Among these, lessons were a commitment to build a new cooperation and communication structure and a different meeting format as well as an emphasis on improving the quality and effectiveness of the discussions by providing more structure and a commitment to follow the structure in the form of the agenda and the participants' roles.
9. Formative assessment should be part of reality, meaning, and play.

Harteveld proposed a triadic approach for designing games, which maintained balance among three components: 'reality', 'meaning', and 'play' (Harteveld, 2011; Harteveld et al., 2009). This approach allows for contextualised design that balances connections among the three perspectives. Here, we build on this approach because when facilitated interventions in the form of formative assessment are added to gameplay, these three additional perspectives can be used as a lens through which to consider aiding participant learning during simulation games. First, we explain the role of the abstracted systems model (relationship of reality and play) and its relationship to learning (relationship of play and meaning) because simulation games are always abstractions of reality; in these abstractions, choices are made that determine what type of feedback is relevant for players, what types of decisions they are allowed to make, and how these decisions relate to reality for the participants (i.e., relationship of reality and play).

Then, we discuss the relationship to the didactic model, particularly concerning the translation of the design-in-the-large (the aims of the game for learning) and the design-in-the-small, as in the translation of the learning goals to the game mechanics. These perspectives should be aligned with the evaluation model of the game, which is directly related to the type of feedback and reflection moments that occur during gameplay, timeouts, and debriefing. Late consideration of evaluation during the design process can override opportunities for learning with formative assessment (Fig. 7.4).

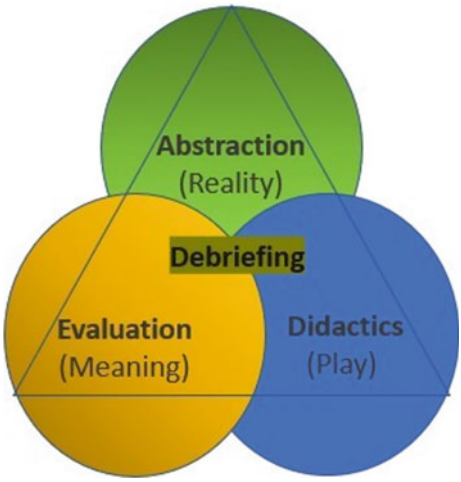

Fig. 7.4 Triadic game design extended, adapted from Harteveld's (2011) concepts of reality, meaning, and play

7.5 The Simulation Model of the Game Should Match the Learning Goals

The simulation model constitutes the backbone of the simulation game. It is a representation of the referent system, with the mechanisms and feedback loops that appeared relevant to the designers (Duke, 2014; Kriz, 2003; Van De Westelaken & Peters, 2011). The purpose of the game (design-in-the-large) should be aligned with the built-in dynamics (design-in-the-small) of the game in such a manner that all relevant dynamics are represented in the game's mechanics (Klabbers, 2009; Kriz, 2003). The selection of variables and relationships depends on factors that provide the main learning challenges for participants. This selection also depends on participant characteristics, such as the level of abstraction that participants are able to manage. Some participants are not accustomed to employing their analytical skills and thus might be unable to work on an abstract level.

7.5.1 The Didactic Model of the Gameplay Should Match the Learning Goals

The didactic game model should contain as many variables as possible that capture the problem for which the game was created; to avoid overloading the participants with stimuli, the model should not contain an excessive number of variables (Duke, 2014). Balancing these types of stimuli is relevant for designing specific and timely feedback, as well as other elements from the gameplay on which participants can base their learning. For example, participants should receive feedback concerning the decisions they make; that feedback should be realistic and focused on the learning goals of the simulation game. In practice, regardless of whether the

learning goal is to experience chaos and to learn something from this chaos, feedback concerning the participants' decisions should be provided in such a manner that participants can reflect on and learn from it. The art of facilitating gameplay is to reduce unnecessary variety and to bring focus, thus increasing the germane cognitive load. However, an advantage of gameplay is that participants experience the effects of their behaviour, decisions, and actions.

A facilitator should have a modestly visible role. Ideally, all interventions aimed at optimising the germane cognitive load are built into the game. For instance, a facilitator might enact an event in which a stakeholder delivers a specific message that directs participants to practice their learning goals; alternatively, the facilitator can play a stakeholder role, providing information that stimulates participants to question their actions or interrupt a particular strategy that is not consistent with their learning goals.

7.5.2 The Evaluation Model for the Gameplay Should Match the Learning Goals

The evaluation model consists of three phases: preparation, reflection, and debriefing. In all three phases, evaluation of the learning goals with formative assessment techniques can enhance learning from the gameplay. Phase-specific examples are provided to illustrate how formative assessment approaches serve to focus learning.

7.5.2.1 Preparation Phase

Formative assessment contributes to the preparation phase because it aids participants in focusing on their learning goals. Techniques used in other fields, such as group decision-making and team cooperation, can aid in preparing participants for learning in simulation games. Among these techniques are:

1. Framing (Fanning & Gaba, 2007) is a technique to focus on learning goals; it adds meaning to the learning process. Simulation games are complex; many things can be learned from them, including communication skills, decision-making skills, and systems competence. These aspects are always part of any type of simulation game. Depending on the learning goals, a participant can prepare for how he or she wants to behave to achieve the learning goals. For instance, 'I want to listen more and talk less, so I will learn more before I act'.
2. Frontloading (Fanning & Gaba, 2007) is a technique that helps participants know what to expect in the gameplay and understand how learning usually occurs in simulation games. It helps them to understand that gameplay can evoke strong emotions and that there is a phase known as 'the valley of despair' (Wenzler & Chartier, 1999), where frustration precedes important learning steps. Knowledge about the function of frustration can aid participants in managing that frustration and accepting the learning experience. Frontloading can be applied to the overall game, to the roles in the game, or to the learning

processes in the game. Some information about the game related to frontloading may be sent to the participants in advance to help them prepare.

3. Funnelling (Fanning & Gaba, 2007; Strike & Rerup, 2016) is a technique whereby the facilitator creates multiple smaller steps towards the learning goals and encourages participants to check on their learning goals in the context of the simulation game learning goals. For instance, the facilitator might announce, 'Today, we are going to play a simulation game to enhance your system's competence. You will engage in a simulation game where you can develop your systems competence skills. This will consist of critical reflection on the added value of your role for yourself, your direct environment, and your larger environment. I will first explain the scenario and roles of the simulation game, and then you will have time for questions. After that, you can begin reflecting on your role in the simulation game and discuss how you want to approach your learning goals in this game with your team'.
4. Goal setting (Azadegan & Kolfschoten, 2014; Briggs Robert et al., 2013; Garcia-Marquez & Bauer, 2021; Kolfschoten & Rouwette, 2006) focuses on concretising participants' (and sometimes facilitators'/researchers') learning goals. Empirical research has shown that goal setting or goal orientation is related to agency and self-efficacy learning, increased motivation, and improved learning outcomes (Garcia-Marquez & Bauer, 2021). Goals may change over the course of the simulation game; it is important to reflect on such changes so that participants make concrete what they learn, then focus on the feedback they need to determine whether they are on the right learning path for themselves.

The method in which these formative methods reduce complexity and focus the learning is described in Chap. 4. Other general preparations such as a pre-test of available knowledge or an assessment of participants' current schemata before gameplay can deliver useful data that will show how participants develop and learn over the course of the gameplay. This provides support for both the facilitator and participants concerning how the learning process develops and whether this is consistent with meaningful learning goals.

Nakamura (2021) used an unpacking method to encourage participants to prepare in a stepwise manner and build their argumentation before engaging in gameplay. During timeouts, participants could reflect on the outcomes of their plans and argumentation. This resulted in more and deeper learning, as well as the enhancement of argumentation and understanding of the learning experience among participants.

7.5.2.2 Periods Between the Reflection and Timeout Phases with Evaluation of Learning Goals During Gameplay

Timeout reflection periods can support the didactic model of gameplay. Immersed in the game flow, participants often use little or no time to reflect on their actions and the feedback they receive (Nakamura, 2021). Reflection is a means of managing the feedback provided thus far by the simulation game; feedback plays an essential role in learning (Bedwell et al., 2012; Brehaut et al., 2016; Salas et al.,

2009), particularly experiential learning (Alklind Taylor, 2014; Kolb & Kolb, 2009). A short timeout can help the participants to understand what has happened and to move beyond simple responsiveness to game stimuli; this can help to focus on relationships with their learning goals. The timeout can provide insight into what participants need from themselves and from others to achieve their goals, which can serve as a leverage point for learning. Additionally, the timeout is a snapshot in time regarding how participants are doing individually and as a group (if structured well) that provides focus and energy to support learning from a particular gameplay session into the next session. The use of structured questions aids participants in making effective use of the timeout (Nakamura, 2021).

7.5.2.3 The Didactic Structure of Reflection on the Game

The didactic structure of the game should match the learning goals. If the game is used to train content and procedures, the formative assessment should be aligned with feedback that is useful for improving participant performance. The feedback should then consist of technical and procedural information. In contrast, the didactic structure for an open policy game should guide participants and facilitators to consider what variables and influences from the game model affect behaviour and decisions in the simulation game as a socio-technical system. This type of feedback can be erratic, complex, and ambiguous; for instance, it may challenge a team to determine how they remain effective under difficult circumstances. The team itself can provide and generate feedback concerning how they perceive their functioning, possibly supplemented by the perspectives of the facilitator and scenario developments. Here, formative evaluation assumes a different shape consistent with the learning goals. However, in either type of simulation game, whether focused on first-order learning in a rule-based setup or second- and third-order learning in an open simulation game setup, the didactic structure of the timeout can be shaped appropriately. In a generic setup, this might be accomplished by using questions such as 'What went well? What went less well?

And what do you need from yourself and from others to achieve better performance?' In more advanced rule-based simulations (e.g., in the military or a medical field), there is a need for advanced skills that move beyond the application of procedures. Both the facilitator and participants can learn from simulation games, including rule-based simulation games. Lessons can be learned from how participants interpret rules; learning can potentially be drawn from aspects that were not included in the norm-based model of the simulation game. This discussion is not explored here because of the scope of this chapter; it is worth mentioning that there is disagreement concerning whether learning is less strict in rule-based simulation games because second- and third-order learning can also apply to these norm-based simulations. Evaluating and questioning norms used in simulation games can be useful for facilitating learning from simulation games.

The didactic structure of the timeout can be established to enable a first-order reflection on the content and procedures of the game, a second-order reflection on the game process, and a third-order reflection on the overall role of the participant. A timeout reflection can be conducted in a short time (5–10 min); this is important

because the timeout reflection should serve to support the game flow and immersion, rather than interrupting it. The inclusion of more than one timeout depends on the gameplay time and the number of game rounds. As a general rule, we recommend 15 min of reflection time per 45 min of playing time. A common thread of relevant game outcomes and learnings can be created from a chronological build-up of reflections after each game round. The debriefing can subsequently serve as a wrap-up derived from the main lessons of each game round.

7.5.2.4 Debriefing After the Gameplay

The evaluation model should align with the experiences of the players in the simulation game. Because these experiences can vary extensively among sessions, any pre-set structure can potentially impede useful reflection. However, insufficient structure could lead to chaos and cognitive overload (Heron, 1993; Vennix, 1999). To meet this challenge, a basic consideration is the reduction of 'noise' in the form of unnecessary information that impedes learners from gaining an overview of their learning goals.

If the didactic model and the evaluation model are well-aligned, debriefing can serve as an opportunity to resolve unanswered questions and finish the weaving of the common thread of reflection that was already created by the game mechanics and formative assessment in the timeouts. The suggestion provided in the chapter on facilitation design, in this book, is to begin with short individual reflections (5 min); followed by a small group (preferably a mixed group consisting of representatives of different roles in the game) for 10–15 min; finalised by a plenary reflection where learnings from each group are summarised, shared, and discussed. This structure serves as a filter for transmitting the most relevant learnings from each individual to the subgroup, then to the organisation (total group). At each level, noise (or in Ashby's[2] words, 'variety') is reduced, and relevant learnings are shared among the group members.

Debriefing is also connected to and overlaps with the didactic model. If the didactic model of the gameplay is shaped well, participants have considerable opportunities for feedback and reflection during gameplay; timeout debriefing phases can resolve unanswered questions and integrate learnings for subsequent transfer to reality. Here, we also suggest reducing variety by providing structure, without reducing energy and focus. Imagine a group full of energy from gameplay subsequently waiting and listening to everyone in a large group; the energy can quickly dissipate. A sound didactic debriefing structure is more upbeat. Everyone can give input, everyone has time to digest and hear other perspectives, and the most relevant outcomes are shared with the entire group.

[2] Ashby is a well-known author of works regarding learning in systems. Ashby proposed the law of requisite variety, which posits that for a system to survive, everything must interact with its environment and add value. In doing so, the system must respond adequately, which means it must learn and formulate a response to the challenges faced Achterbergh, J., & Vriens, D. J. (2010). *Organizations: social systems conducting experiments* (2nd rev. ed.). Springer, Raadt, J. D. R. d. (1987). Ashby's law of requisite variety: an empirical study. *Cybernetics and Systems, 18*(6), 517–536. https://doi.org/10.1080/01969728708902152.

7.5.2.5 Meta-Debriefing: Evaluation of the Functioning of the Game and the Facilitator

It is useful to evaluate the effects of the game and facilitation in context because each context is unique and has factors that influence the gameplay (Leigh, 2003b; Leigh & Spindler, 2005). Both the game and the facilitator's interventions, as well as the overall impact, must be evaluated considering the conditions under which the simulation game was played to ensure that it is played as well as it can be. Game designers and facilitators are inherently manipulators (Leigh, interview); thus, we have an ethical responsibility to ensure that the game delivers a productive learning environment to participants while ensuring safety. Aristotle provides advice concerning how to be a virtuous person: be a person who does his or her best for the right reasons (i.e., wanting to do the right thing) (Achterbergh & Vriens, 2010). As game designers and facilitators, we are in powerful positions; this also requires us to be responsible for maintaining ethical behaviour. Aristotle advised the use of multiple perspectives from the different stakeholders involved, followed by preparation and evaluation, then learning from context to further develop a sense of a particular situation. These considerations have been described in greater detail in a special issue on facilitation in the Journal Simulation and Gaming (De Wijse, 2021).

7.6 Discussion and Conclusion: Aligning the Evaluation, Didactic, and Meta-Debriefing Models

Imagine if the purpose of the game (design-in-the-large) was not aligned with the didactic model (mechanics of the game). Then, the purpose of the game would not be translated into processes and triggers from which participants could learn; evaluation would be awkward because participants would find it difficult to debrief on processes, and they could not relate to their learning goals or the aims of the game.

In case of study research, one of the authors witnessed a rule-based game that was intended for an adaptive learning goal. Thus, the mechanics were based on a list of rules that created a bureaucratic organisation, which did not match the need for adaptivity. Participants had insufficient autonomy and no ability to gain an overview in a simulation that had a procedural, non-adaptive setup; they frequently made mistakes and interpreted procedures that they did not know and to which they could not relate. For the participants, the aims of the procedures and rules of the game were not connected to their personal learning purposes; therefore, such aims made no sense for the participants' meaning-making processes. Participants could not identify how the processes in the game would contribute to their learning goals, which consisted of forming an adaptive team that could manage unexpected challenges. During the gameplay and in debriefing, participants regularly explained that they could not make sense of the simulation game or its rules and procedures. During the evaluation, where the facilitator was mainly explaining and talking, they

were passive and 'lost in a fog'. There was no opportunity for them to make sense of the processes they had experienced during the gameplay and the connection to their learning goals. Because of their limited autonomy, participants were unable to receive the feedback they needed. In addition, the rules of the game distracted them from their learning goals.

It is worthwhile to consider all three models to achieve a coherent entity wherein learning processes serve participants in accordance with the purposes of the game. We provide another example to illustrate this. Imagine that participants enrolled in a project management course; halfway through the course, they engaged in a project management game. They were asked to formulate their personal learning goals related to project management; one participant reported that his goal was to gain project management experience to better anticipate unforeseen problems such as budget overruns and delays. During the gameplay, events were aimed at delays and budget overruns, along with negative news on the project in the media and a change in project funders halfway through the project, thus demanding new project norms. The evaluation model was focused on reflection concerning what participants learned during the different phases of the gameplay; during gameplay, participants also kept a personal log, recording their aims and reflections about their decisions. The debriefing served as a wrap-up for gathering lessons from the gameplay and making translations to reality. During the debriefing, the participant stated that he had learned to be more assertive and more communicative. In the first game round, he should have proactively interacted with the media. Because he did not issue a press release, the media used some information that was subsequently found to be unreliable. During the second game round, the participant learned that he needed to, more carefully, consider information from the new project funder. He nearly reached a difficult position concerning the budget because of demands from the new project funder. He assumed that everything was required to stay within budget; after a conversation with the project funder, he understood that he could receive extra funds because of the changed demands. The participant concluded that he needed to be more assertive while listening more carefully. This deviated from his original goal formulation, but it was a more precise and personalised lesson outcome that contributed to his learning goal.

This example shows how well-integrated models can bring flow, focus, and reduction in noise during learning. By reducing the complexity during the learning processes, attention could be focused on learning outcomes. In addition, formative assessment should be applied in a contextualised manner (Bennett, 2011) that serves the specific needs of the participants, game, and facilitator. Effective formative assessment is integrated into the game mechanics and is not disruptive to the game flow; the added value of the simulation game as a learning environment is thus maintained. We advise mixing the methods used, from self-reports to peer feedback, and from in-game audits/feedback data to group discussion (this can also be shaped into a meeting between roles and planned into the game) to provide for multiple perspectives and opportunities to learn from. This will add to the learning, agency, motivation, and game flow, rather than disrupting them.

7.7 Recommendations for Future Research

Evaluation of the learning effects of simulation games has received less attention than comparable research in the field, and it continues to merit attention (Bellotti et al., 2020; Faizan et al., 2019; Mayer et al., 2014; Salas et al., 2009; Vlachopoulos & Makri, 2017). There is a need to dismiss the idea that evaluation is excessively difficult, time-consuming, or potentially dangerous. Ethical considerations are involved in the evaluation and formative assessment with respect to whether and how the evaluative design and evaluative facilitation of a game support learners, rather than restricting them to a specific learning direction. In addition, to ensure ethical conduct and support learning, multiple perspectives must be considered regarding learning and the concepts to be learned (de Wijse-van Heeswijk, 2021). To serve as professionals in our field, we must engage in additional introspection regarding the functioning and effects of our game simulations and our facilitation. We have a moral obligation to this introspection, in addition to our practical obligation, because we want our simulation games to add value and avoid hurting people (Mayer et al., 2014). Finally, we must share our results in academic and practitioners' communities. More research is needed regarding the following questions:

a. How can formative assessment be designed into simulation games to enhance learning effects (on an aggregate level and on a game-specific contextual level)?
b. What formal evaluation methods are used in gameplay and debriefing?
c. What types of evaluative methods are used to facilitate the meta-debriefing in a useful manner?
d. What impact do diverse formative assessment methods have, what is the impact of which method, and in what manner should each method be applied given contextual considerations?

We must complete our own learning loop by evaluating our work, learning from practice, and further developing our practical and theoretical knowledge. Otherwise, we will be subject to our own blind spots; we might not recognise the impacts of our games, facilitation, and debriefing efforts. Experience can also cause biases; if people believe in something, they can easily become biased about it. An academic professional must continue searching for counter evidence; generally, true and close friends will easily provide direct feedback. However, there can be present a high threshold for direct feedback concerning simulation game participants, particularly in the context of curricula where they depend on the approval of colleagues and managers. Participation in simulation games is never completely voluntary (Eric Treske, interview quote 2019); group pressure might prevent the application of necessary perspectives. We must accept our moral responsibility to do our best as professionals in the field (Mayer et al., 2014). Because we work with powerful instruments that can do extensive well and extensive damage, we must assume an ethical stance in evaluation simulation games. In this context, the evaluation of effects is critical. As Aristotle prescribed, we must evaluate different perspectives with respect to the people involved (especially the participants) to ensure that we

develop an understanding of specific contexts and can improve our skill and tacit knowledge (for more on this, see the article concerning the ethical role of the facilitator in simulation games by De Wijse-van Heeswijk, 2021). The establishment of communities of practice could serve as a step towards learning from each other and sharing knowledge through scientific publications and research concerning successful methods. Evaluation can be conducted with a low profile. Individuals are not necessarily required to be academics to focus on the active acquisition of data regarding effects. Valuable information can be gathered by asking a few open-ended questions about how participants experienced the gameplay in relation to their learning goals. Many academics in the field are happy to share their knowledge and contribute to case studies to assess the effects of simulation games in different contexts (see, for example, the Meega project, in which the quality of the gameplay is measured with open-use questionnaires[3]).

Various types of formative assessment methods, as well as different intensities, could be useful in different contexts; students are known to have narrower schemata and are more susceptible to cognitive overload than are experienced people or experts (Sweller et al., 2007). New developments in the gaming field (e.g., multi-sensory gaming and emergent games that are played with mobile phones) can provide very real experiences; debriefing is often not part of the process. It remains unclear how sensible this lack of debriefing is, considering that these experienced realities can contain biases and might leave participants with attitudes that could negatively influence their lives. As noted earlier, all education is inherently manipulative, especially in simulation games, where experiences during gameplay are perceived to be very realistic. Contextualised knowledge about which games render specific effects under certain conditions can improve ethical conduct, create better learning effects, and professionalise the roles of facilitators and game designers. Of course, knowledge about the evaluation of simulation games is helpful; some examples have been mentioned in this chapter. It is not as difficult as it may initially appear, and you are bound to learn along the way.

Some Questions

How can formative assessment add value in learning from simulation games?
What is the relationship between and additive value of formative and summative assessments in simulation games?
What is a simulation model, an evaluation model, and a didactic model of a simulation game and how do these interrelate to add value for learning from simulation games?
When does formative assessment add value in simulation games?

[3] Meega project: http://www.gqs.ufsc.br/quality-evaluation/meega-plus/.

References

Achterbergh, J., & Vriens, D. J. (2010). *Organizations: Social systems conducting experiments* (2nd rev. ed.). Springer.

Alklind Taylor, A.-S. (2014). *Facilitation matters: A framework for instructor-led serious gaming*. University of Skövde.

Alklind Taylor, A.-S., Backlund, P., & Niklasson, L. (2012). The coaching cycle: A coaching-by-gaming approach in serious games. *Simulation & Gaming, 43*(5), 648–667.

Argyris, C. (1976). Leadership, learning and changing the status quo. *Organizational Dynamics, 4*(3), 29–43. https://doi.org/10.1016/0090-2616(76)90034-6.

Argyris, C. (1982). *Reasoning, learning, and action: Individual and organizational*. Jossey-Bas.

Argyris, C. (2004). Reflection and beyond in research on organizational learning. *Management Learning, 35*(4), 507–509. https://doi.org/10.1177/1350507604048276.

Auchter, E., & Kriz, W. (2013). Gender aspects by using start-up simulations for entrepreneurship education results of theory-based evaluation studies. *Journal of Asia Entrepreneurship and Sustainability, 9*(1), 39.

Azadegan, A., & Kolfschoten, G. (2014). An assessment framework for practicing facilitator. *Group Decision and Negotiation, 23*(5), 1013–1045. https://doi.org/10.1007/s10726-012-9332-4.

Barber, L., Bagsby, P., Grawitch, M., & Buerck, J. (2011). Facilitating self-regulated learning with technology: Evidence for student motivation and exam improvement. *Teaching of Psychology, 38*(4), 303–308.

Bausch, K. C. (2000). The practice and ethics of design. *Systems Research and Behavioral Science, 17*(1), 23–50. https://doi.org/10.1002/(sici)1099-1743(200001/02)17:1.

Bedwell, W. L., Pavlas, D., Heyne, K., Lazzara, E. H., & Salas, E. (2012). Toward a taxonomy linking game attributes to learning: An empirical study. *Simulation & Gaming, 43*(6), 729–760. https://doi.org/10.1177/1046878112439444.

Bekebrede, G., Lo, J., & Lukosch, H. (2015). Understanding complexity: The use of simulation games for engineering systems. *Simulation and Gaming, 46*(5), 447–454. https://doi.org/10.1177/1046878115618140.

Bell, B., Bell, N., & Cowie, B. (2001). *Formative assessment and science education* (Vol. 12). Springer Science & Business Media.

Bellotti, F., Berta, R., Paranthaman, P., Dange, G., & De Gloria, A. (2020). REAL: Reality-enhanced applied games. *IEEE Transactions on Games, 12*(3), 281–290. https://doi.org/10.1109/tg.2019.2940108.

Bellotti, F., Kapralos, B., Lee, K., Moreno-Ger, P., & Berta, R. (2013). Assessment in and of serious games: An overview. *Advances in Human-Computer Interaction, 2013*, Article 136864. https://doi.org/10.1155/2013/136864.

Bennett, R. E. (2011). Formative assessment: A critical review. *Assessment in Education: Principles, Policy & Practice, 18*(1), 5–25. https://doi.org/10.1080/0969594x.2010.513678.

Brehaut, J. C., Colquhoun, H. L., Eva, K. W., Carroll, K., Sales, A., Michie, S., Ivers, N., & Grimshaw, J. M. (2016). Practice feedback interventions: 15 suggestions for optimizing effectiveness. *Annals of Internal Medicine, 164*(6), 435–441. https://doi.org/10.7326/m15-2248.

Briggs Robert, O., Kolfschoten, G. L., De Vrede, G.-J., Lukosch, S., & Albrecht, C. C. (2013). Facilitator-in-a-box: Process support applications to help practitioners realize the potential of collaboration technology. *Journal of Management Information Systems, 29*(4), 159–193.

Chin, J., Dukes, R., & Gamson, W. (2009). Assessment in simulation and gaming: A review of the last 40 years. *Simulation & Gaming, 40*(4), 553–568. https://doi.org/10.1177/1046878109332955.

Christopher, E., & Smith, L. (1990). Shaping the content of simulation/games. In *Simulation, gaming, and language learning* (pp. 47–54).

Daniel, P. A., & Daniel, C. (2018). Complexity, uncertainty and mental models: From a paradigm of regulation to a paradigm of emergence in project management. *International Journal of Project Management, 36*(1), 184–197. https://doi.org/10.1016/j.ijproman.2017.07.004.

Deen, M. (2015). *GAME games autonomy motivation & education*. Lulu.com.

Delacruz, G. C. (2010). *Games as formative assessment environments: Examining the impact of explanations of scoring and incentives on math learning, game performance, and help seeking*. University of California.

Dieckmann, P., Friis, S. M., Lippert, A., & Ostergaard, D. (2012). Goals, success factors, and barriers for simulation-based learning: A qualitative interview study in health care. *Simulation and Gaming, 43*(5), 627–647. https://doi.org/10.1177/1046878112439649.

Dolin, J., Black, P., Harlen, W., & Tiberghien, A. (2018). Exploring relations between formative and summative assessment. In *Transforming assessment* (pp. 53–80). Springer.

Duke, R. D. (2014). *Gaming: The future's language*. W. Bertelsmann Verlag.

Elder-Vass, D. (2007). Luhmann and emergentism. *Philosophy of the Social Sciences, 37*(4), 408–432.

Eppich, W. J., Rethans, J.-J., Dornan, T., & Teunissen, P. W. (2018). Learning how to learn using simulation: Unpacking disguised feedback using a qualitative analysis of doctors' telephone talk. *Medical Teacher, 40*(7), 661–667. https://doi.org/10.1080/0142159X.2018.1465183.

Faizan, N., Löffler, A., Heininger, R., Utesch, M., & Krcmar, H. (2019). Classification of evaluation methods for the effective assessment of simulation games: Results from a literature review.

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(2), 115–125.

Fazey, I., Schäpke, N., Caniglia, G., Patterson, J., Hultman, J., van Mierlo, B., Säwe, F., Wiek, A., Wittmayer, J., Aldunce, P., Al Waer, H., Battacharya, N., Bradbury, H., Carmen, E., Colvin, J., Cvitanovic, C., D'Souza, M., Gopel, M., Goldstein, B., Hämäläinen, T., Harper, G., Henfry, T., Hodgson, A., Howden, M. S., Kerr, A., Klaes, M., Lyon, C., Midgley, G., Moser, S., Mukherjee, N., Müller, K., O'Brien, K., O'Connell, D. A., Olsson, P., Page, G., Reed, M. S., Searle, B., Silvestri, G., Spaiser, V., Strasser, T., Tschakert, P., Uribe-Calvo, N., Waddell, S., Rao-Williams, J., Wise, R., Wolstenholme, R., Woods, M., & Wyborn, C. (2018). Ten essentials for action-oriented and second order energy transitions, transformations and climate change research. *Energy Research & Social Science, 40*, 54–70. https://doi.org/10.1016/j.erss.2017.11.026

Feinstein, A. H., & Cannon, H. M. (2002). Constructs of simulation evaluation. *Simulation & Gaming, 33*(4), 425–440. https://doi.org/10.1177/1046878102238606.

Feldon, D. F., Callan, G., Juth, S., & Jeong, S. (2019). Cognitive load as motivational cost. *Educational Psychology Review, 31*(2), 319–337. https://doi.org/10.1007/s10648-019-09464-6.

Garcia-Marquez, C., & Bauer, K. N. (2021). An examination and extension of the theory of gamified learning: The moderating role of goal orientation. *Simulation & Gaming, 52*(4), 407–434. https://doi.org/10.1177/1046878120958741.

Geurts, J. (2015). Over Systemen, Organisaties en Grenzen. *afscheidsrede Universiteit vanTilburg*.

Geurts, J. L. A., Caluwé, L. o. d., & Stoppelenburg, A. (2000). *Changing organisations with gaming/simulations*. Elsevier bedrijfsinformatie.

Ginns, P., & Leppink, J. (2019). Special issue on cognitive load theory: Editorial. *Educational Psychology Review, 31*(2), 255–259. https://doi.org/10.1007/s10648-019-09474-4.

Gugerell, K., & Zuidema, C. (2017). Gaming for the energy transition. Experimenting and learning in co-designing a serious game prototype. *Journal of Cleaner Production, 169*, 105–116. https://doi.org/10.1016/j.jclepro.2017.04.142.

Hamdaoui, N., Idrissi, M. K., & Bennani, S. (2018). Modeling learners in educational games: Relationship between playing and learning styles. *Simulation & Gaming, 49*(6), 675–699. https://doi.org/10.1177/1046878118783804.

Harlen, W., & James, M. (1997). Assessment and learning: Differences and relationships between formative and summative assessment. *Assessment in Education: Principles, Policy & Practice, 4*(3), 365–379. https://doi.org/10.1080/0969594970040304.

Harteveld, C. (2011). *Triadic game design: Balancing reality, meaning and play*. Springer Science & Business Media.

Harteveld, C., Guimarães, R., Mayer, I. S., & Bidarra, R. (2009). Balancing play, meaning and reality: The design philosophy of LEVEE PATROLLER. *Simulation & Gaming, 41*(3), 316–340. https://doi.org/10.1177/1046878108331237.

Hattie, J., Biggs, J., & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of Educational Research, 66*(2), 99–136.

Hense, J., & Kriz, W. C. (2008). Making simulation games an even more powerful tool. Introducing the theory-based evaluation approach. In *Why do games work* (pp. 211–217).

Hense, J., Kriz, W. C., & Wolfe, J. (2009). Putting theory-oriented evaluation into practice: A logic model approach for evaluating SIMGAME. *Simulation & Gaming, 40*(1), 110–133. https://doi.org/10.1177/1046878107308078.

Heron, J. (1993). *Group facilitation: Theories and models for practice*. Kogan Page London.

Hooshyar, D., Ahmad, R. B., Yousefi, M., Fathi, M., Horng, S.-J., & Lim, H. (2016). Applying an online game-based formative assessment in a flowchart-based intelligent tutoring system for improving problem-solving skills. *Computers & Education, 94*, 18–36.

Ke, F. (2016). Designing and integrating purposeful learning in game play: A systematic review. *Educational Technology Research and Development: A Bi-Monthly Publication of the Association for Educational Communications & Technology, 64*(2), 219–244. https://doi.org/10.1007/s11423-015-9418-1.

Kichmeier-Rust, M., Marte, B., Line, S., Lalonde, T., & Albert, D. (2008). *The effects of individualized feedback in digital educational games*. <Go to ISI>://WOS:000264585800027.

Kickmeier-Rust, M. D., Steiner, C. M., & Albert, D. (2009). *Non-invasive assessment and adaptive interventions in learning games*. https://doi.org/10.1109/incos.2009.30.

Kim, D. H. (1993). The link between individual and organizational learning. *Sloan Management Review, 35*(1), 37–50. <Go to ISI>://WOS: A1993MB30400024.

Klabbers, J. H. G. (2000). Learning as acquisition and learning as interaction. *Simulation & Gaming, 31*(3), 380–406. https://doi.org/10.1177/104687810003100304.

Klabbers, J. H. G. (2009). *The magic circle: Principles of gaming & simulation* (3rd and rev. ed.). Sense Publishers.

Klabbers, J. H. G. (2018). On the architecture of game science. *Simulation & Gaming, 49*(3), 207–245. https://doi.org/10.1177/1046878118762534.

Kolb, A. Y., & Kolb, D. A. (2009). The learning way: Meta-cognitive aspects of experiential learning. *Simulation & Gaming, 40*(3), 297–327. https://doi.org/10.1177/1046878108325713.

Kolfschoten, G. L., & Rouwette, E. A. (2006). Choice criteria for facilitation techniques.

Kriz, W. C. (2003). Creating effective learning environments and learning organizations through gaming simulation design. *Simulation & Gaming, 34*(4), 495–511. https://doi.org/10.1177/1046878103258201.

Kriz, W. C., & Hense, J. U. (2006). Theory-oriented evaluation for the design of and research in gaming and simulation. *Simulation & Gaming, 37*(2), 268–283. https://doi.org/10.1177/1046878106287950

Kriz, W. C. (2010). A systemic-constructivist approach to the facilitation and debriefing of simulations and games. *Simulation & Gaming, 41*(5), 663–680. https://doi.org/10.1177/1046878108319867.

Kriz, W. C. (2011). Qualitätskriterien von Planspielanwendungen. In *Planspiel–Qualität und Innovation. Neue Ansätze aus Theorie und Praxis* (pp. 11–37).

Kriz, W. C., & Auchter, E. (2016). 10 years of evaluation research into gaming simulation for German entrepreneurship and a new study on its long-term effects. *Simulation & Gaming, 47*(2), 179–205. https://doi.org/10.1177/1046878116633972.

Kriz, W. C., Auchter, E., & Wittenzellner, H. (2008). Theory-based evaluation of entrepreneurship education with simulation games. *Indian Journal of Economics and Business, 1*, 19.

Kriz, W. C., Clapper, T. C., & Harviainen, J. T. (2019). Obituary for Allan G. Feldt: Pioneer in Urban Gaming and Co-Founder of the International Simulation and Gaming Association (ISAGA). *Simulation & Gaming, 50*(3), 408–410. https://doi.org/10.1177/1046878119863248.

Kumar, R. (2018). Formative knowledge assessment through games using concept map and game theory. *Journal of Information & Knowledge Management, 17*(3), Article 1850030. https://doi.org/10.1142/s0219649218500302.

Laere, van J., Lindblom, J., & de Wijse-van Heeswijk, M. (2021). Complexifying facilitation by immersing in lived experiences of on-the-fly facilitation. *Simulation & Gaming*. https://doi.org/10.1177/10468781211006751.

Leigh, E. (2003a). It all depends'. Interact, integrate, impact. In *Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education ASCILITE*, Adelaide, Australia.

Leigh, E. (2003b). *A practitioner researcher perspective on facilitating an open, infinite, chaordic simulation: Learning to engage in theory while putting myself into practice.*.

Leigh, E., & Spindler, L. (2004). Simulations and games as chaordic learning contexts. *Simulation & Gaming, 35*(1), 53–69. https://doi.org/10.1177/1046878103252886.

Leigh, E., & Spindler, L. (2005). Congruent facilitation of simulations and games. In *Gaming, simulations, and society* (pp. 189–198). Springer.

Lukosch, H. K., Bekebrede, G., Kurapati, S., & Lukosch, S. G. (2018). A scientific foundation of simulation games for the analysis and design of complex systems. *Simulation & Gaming, 49*(3), 279–314. https://doi.org/10.1177/1046878118768858.

Mayer, I., Bekebrede, G., Harteveld, C., Warmelink, H., Zhou, Q., van Ruijven, T., Lo, J., Kortmann, R., & Wenzler, I. (2014). The research and evaluation of serious games: Towards comprehensive methodology. *British Journal of Educational Technology, 45*(3), 502–527. https://doi.org/10.1111/bjet.12067.

McMullen, M., Wilson, R., Fleming, M., Mark, D., Sydor, D., Wang, L., Zamora, J., Phelan, R., & Burjorjee, J. E. (2016). "Debriefing-on-demand": A pilot assessment of using a "pause button" in medical simulation. *Simulation in Healthcare, 11*(3), 157–163. https://doi.org/10.1097/sih.0000000000000140.

Nakamura, M. (2021). Unpacking and disclosing the reasoning behind "A Structured Instruction Improves Team Performance" conference proceedings ISAGA Indore 21.

Nesbit, P. L. (2012). The role of self-reflection, emotional management of feedback, and self-regulation processes in self-directed leadership development. *Human Resource Development Review, 11*(2), 203–226. https://doi.org/10.1177/1534484312439196.

OECD. https://www.oecd.org/education/.

Palmunen, L.-M., Lainema, T., & Pelto, E. (2021). Towards a manager's mental model: Conceptual change through business simulation. *The International Journal of Management Education, 19*(2), 100460.

Peters, V., Ewerwijn, H., & van de Westelaken, M. (2014). *The evaluation of a discipline: A framework for evaluating simulation games*. Bielefeld: Bertelsmann Verlag.

Petri, G., von Wangenheim, C. G., & Borgatto, A. F. (2016). A large-scale evaluation of a model for the evaluation of educational games. In *INCoD/GQS*.

Petri, G., & von Wangenheim, C. G. (2016). How to evaluate educational games: A systematic. *Journal of Universal Computer Science, 22*(7), 992–1021.

Plass, J. L., Homer, B. D., Kinzer, C., Frye, J., & Perlin, K. (2011). Learning mechanics and assessment mechanics for games for learning. *G4LI White Paper, 1*, 2011.

Raadt, J. D. R. d. (1987). Ashby's law of requisite variety: An empirical study. *Cybernetics and Systems, 18*(6), 517–536. https://doi.org/10.1080/01969728708902152.

Raghothama, J. (2017). *Integrating computational and participatory simulations for designing complex systems* [Doctoral dissertation, KTH Royal Institute of Technology].

de Ries, K. E., Schaap, H., van Loon, A.-M. M. J. A. P., Kral, M. M. H., & Meijer, P. C. (2021). A literature review of open-ended concept maps as a research instrument to study knowledge and learning. *Quality & Quantity*. https://doi.org/10.1007/s11135-021-01113-x

Rodríguez-Aflecht, G., Hannula-Sormunen, M., McMullen, J., Jaakkola, T., & Lehtinen, E. (2016). Voluntary vs compulsory playing contexts: Motivational, cognitive, and game experience effects. *Simulation & Gaming, 48*(1), 36–55. https://doi.org/10.1177/1046878116673679.

Roungas, B., de Wijse, M., Meijer, S., & Verbraeck, A. (2016). Pitfalls for debriefing games and simulations: Theory and practice. In *Intersections in simulation and gaming* (pp. 101–115). Springer.

Sadler, D. R. (1998). Formative assessment: Revisiting the territory. *Assessment in Education: Principles, Policy & Practice, 5*(1), 77–84. https://doi.org/10.1080/0969595980050104.

Salas, E., Rosen, M., Held, J., & Weissmuller, J. (2009). Performance measurement in simulation-based training. *Simulation & Gaming, 40*(3), 328–376.

Schwägele, S., Zürn, B., Lukosch, H. K., & Freese, M. (2021). Design of an impulse-debriefing-spiral for simulation game facilitation. *Simulation & Gaming, 52*(3), 364–365. https://doi.org/10.1177/10468781211006752.

Seeber, I. (2019). How do facilitation interventions foster learning? The role of evaluation and coordination as causal mediators in idea convergence. *Computers in Human Behavior, 94*, 176–189. https://doi.org/10.1016/j.chb.2018.11.033.

Sewell, W. H. (1992). A theory of structure - Duality, agency and transformation. *American Journal of Sociology, 98*(1), 1–29. https://doi.org/10.1086/229967.

Shute, V., Rahimi, S., & Emihovich, B. (2017). Assessment for learning in immersive environments. In D. Liu, C. Dede, R. Huang, & J. Richards (Eds.), *Virtual, augmented, and mixed realities in education* (pp. 71–87). https://doi.org/10.1007/978-981-10-5490-7_5.

Simon, H. A. (1997). *Administrative behavior: A study of decision-making processes in administrative organizations* (4th ed.). The Free Press.

Sitter, L. U. d. (1981). *Op weg naar nieuwe fabrieken en kantoren: produktie-organisatie enarbeidsorganisatie op de tweesprong: een rapport inzake de kwaliteit van de arbeid, organisatie en arbeidsverhoudingen*. Kluwer.

Strike, V. M., & Rerup, C. (2016). Mediated sensemaking. *Academy of Management Journal, 59*(3), 880–905. https://doi.org/10.5465/amj.2012.0665.

Sweller, J., Kirschner, P., & Clark, R. (2007). Why minimally guided teaching techniques do not work: A reply to commentaries. *Educational Psychologist, 42*(2), 115–121.

Teach, R. D. (1990). Profits: The false prophet in business gaming. *Simulation & Gaming, 21*(1), 12–26. https://doi.org/10.1177/1046878190211002.

Teach, R. (1993). Forecasting and management ability: A response to Wolfe. *Simulation & Gaming, 24*(1), 63–72. https://doi.org/10.1177/1046878193241007.

Teo, P. (2019). Teaching for the 21st century: A case for dialogic pedagogy. *Learning, Culture and Social Interaction, 21*, 170–178.

Tieben, R. (2015). Activating play: A design research study on how to elicit playful interaction from teenagers.

Tosey, P., Visser, M., & Saunders, M. N. K. (2012). The origins and conceptualizations of 'triple-loop' learning: A critical review. *Management Learning, 43*(3), 291–307. https://doi.org/10.1177/1350507611426239.

Tsai, F.-H., Tsai, C.-C., & Lin, K.-Y. (2015). The evaluation of different gaming modes and feedback types on game-based formative assessment in an online learning environment. *Computers & Education, 81*, 259–269.

Tsoukas, H. (2017). Don't simplify, complexify: From disjunctive to conjunctive theorizing in organization and management studies. *Journal of Management Studies, 54*(2), 132–153.

Tsoukas, H., & Chia, R. (2002). On organizational becoming: Rethinking organizational change. *Organization Science, 13*(5), 567–582.

Van De Westelaken, M., & Peters, V. (2011). Spelsimulaties-een kennismaking. *Nijmegen: Samenspraak Advies Nijmegen.*

Van Den Hoogen, J., Lo, J., Meijer, S., & Winter Simulation Conference, W. S. C. (2015). Debriefing in gaming simulation for research: Opening the black box of the non-trivial machine to assess validity and reliability. In *Proceedings - Winter Simulation Conference, 2015-January* (pp. 3505–3516). https://doi.org/10.1109/WSC.2014.702018.

Van Laere, J., & Lindblom, J. (2019). Cultivating a longitudinal learning process through recurring crisis management training exercises in twelve Swedish municipalities. *Journal of Contingencies and Crisis Management, 27*(1), 38–49.

Vennix, J. A. M. (1999). Group model-building: Tackling messy problems. *System Dynamics Review, 15*(4), 379–401. <Go to ISI>://WOS:000085273400003.

Visser, M. (2007). Deutero-learning in organizations: A review and a reformulation. *Academy of Management Review, 32*(2), 659–667. https://doi.org/10.5465/AMR.2007.24351883.

Vlachopoulos, D., & Makri, A. (2017). The effect of games and simulations on higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education, 14*(1), 1–33.

Von Foerster, H. (1984). Principles of self-organization—In a socio-managerial context. In *Self-organization and management of social systems* (pp. 2–24). Springer.

Wardaszko, M. (2019). Simulation & gaming through times and across disciplines. Akademia Leona Kozminskiego.

Watt, K., & Smith, T. (2021). Research-based game design for serious games. *Simulation & Gaming, 52*(5), 601–613. https://doi.org/10.1177/10468781211006758.

Wenzler, I., & Chartier, D. (1999). Why do we bother with games and simulations: An organizational learning perspective? *Simulation & Gaming, 30*(3), 375–384.

Wijse-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332. https://doi.org/10.1177/10468781211015707.

Willcoxson, L., & Prosser, M. (1996). Kolb's learning style inventory (1985): Review and further study of validity and reliability. *British Journal of Educational Psychology, 66*, 247–257. https://doi.org/10.1111/j.2044-8279.1996.tb01193.x.

Wilson, K. A., Bedwell, W. L., Lazzara, E. H., Salas, E., Burke, C. S., Estock, J. L., Orvis, K. L., & Conkey, C. (2008). Relationships between game attributes and learning outcomes: Review and research proposals. *Simulation & Gaming, 40*(2), 217–266. https://doi.org/10.1177/10468781083218.

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The Thorny Issue of Time

8

Willy C. Kriz

Overview

When the editors of this volume asked me to write a chapter on the thorny issue of time in simulation gaming, I quickly agreed, without anticipating quite how thorny it would turn out to be. Although, Thavikulwat (1996, p. 110) wrote, "In simulation, as in life, time is of the essence" around 25 years ago, his article remains one of the few that has elaborated on the issue of time in simulation games. Despite the importance of time, almost no articles can be found, and empirical evidence is rare about the issue of time and simulation and gaming methodology. This largely neglected topic clearly warrants a chapter in this publication, and due to my many years of simulation game design, facilitation and my role as past editor of the Journal *Simulation & Gaming*, I will make an attempt to highlight relevant themes within the context of time. Therefore, this article will describe some selected aspects with reference to articles by authors and colleagues, sometimes even based only on anecdotal evidence and my own experience as a game designer and facilitator. The hope is that readers will find at least some interesting perspectives for their own future work as well as develop ideas for more empirical studies.

Keywords

Time · Timing · Design · Abstraction · Aggregation · Learning · Ethics · Briefing · Gameplay · Debriefing

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Learning Objectives

- to understand the potential of gaming simulation to co-create utopia and uchronia;
- to know about the relation between aggregation and abstraction in games and treatment of time in different game formats;
- to learn about options for managing time in simulation games;
- to reflect on issues of ethics, experience of long-term effects and game models;
- to receive some basic ideas and suggestions on the use of time in briefing, gameplay and debriefing.

8.1 Gaming Simulation: Utopia and Uchronia

In 1974, Richard Duke, one of the founding fathers of the International Simulation and Gaming Association (ISAGA), wrote the influential book *Gaming: The Future's Language*, which is widely regarded as the modern classic of gaming literature.

He also introduced a 21-step framework for simulation-game design (Duke & Geurts, 2004). Jan Klabbers served as ISAGA's chairman for almost three decades, and his contribution entitled *The Magic Circle: Principles of Gaming & Simulation* is regarded as the second key contribution on gaming architecture together with Duke's work (e.g., Klabbers, 2009, 2018). Among other concepts, it is important to understand the interconnections between the main building blocks of reference systems (in social constructs and so-called "reality") and games as representing models of reference system processes: actors, rules and resources.

Duke (1974) described gaming simulation as a form of communication that is aimed at a better understanding of complex systems and the development of ideas and concepts of alternative and "better" futures. In an interview with me, Ivo Wenzler, a former student of Duke's, used the term *memories of the future* to highlight gaming's strength in exploring dysfunctional situations and the interconnected content and context factors that create the dynamic system patterns of the dysfunctional past and present. Gaming simulation also enables the participating stakeholders to develop, select and shape a shared vision of the future and empowers participants to implement measures to change dysfunctional patterns into desired patterns (Kriz, 2022).

Paola Rizzi, another former of Duke's students (and my own most important mentor in gaming), explored the aspects of time (*uchronia* as exploring and designing a hypothetical time and/or alternative future) and space (*utopia* as exploring and designing a hypothetical space and/or alternative world) through gaming. Her discussion of the power of gaming to connect the understanding of the past, present and future leads directly to a more philosophical aspect of gaming and the issue of time (Rizzi, 2014a). Duke and I named our book *Back to the Future of Gaming* to refer playfully to this aspect (Duke & Kriz, 2014). In an interview with me (Kriz, 2022), Rizzi said,

> Gaming simulation is … continuously updated and in some way a dynamic, multidimensional instrument which allows the experience of the simultaneous presence of the past of the present and the foreseeable future.
>
> … One thing that we have to consider is that gaming simulation for me is also a sort of, let's say, language that is able to make the participants aware of the control of their own destiny, managing the complexity and ruling the uncertainty that accompanies it.

García-Carbonell et al. (2001, p. 504) had already expressed a similar aspect of gaming simulation as *action potential for the future.* According to Rizzi (2014b), gaming simulation becomes the ideal instrument capable of bridging the idea of the present with one of the possible futures and becomes a hybrid technique in the processes of designing the future. It is an attempt to do something for the future on the basis of the past (data) in the fleeting present.

> Through the gaming simulation we can face the processes of designing time and space. And to do so, we built utopias and uchronias … At the same time, gaming simulation creates a temporal void, a sort of dilatation combined with acceleration of time. In this artificial world where the everyday continuity of time and space is split, the fleetingness of time is accelerated. This allows a perceptive construct of the possible future. This is because memory is an imaginative means if not a tool rather than an archive of a lived past, as Aristotle and Galeno pointed out. A gaming simulation reaches a "pre-vision" of the future through emotions it generates. We can face hypothetical scenarios before making decisions. This is what makes gaming simulation such an efficient tool for planning: future thinking. Gaming simulation is almost all about future thinking. It is building uchronias that, once built and explored, have impact on decisions made in the immediate present (Rizzi, 2014b, p. 61).

Through play and debriefing, participants can learn and understand something useful about the world and certain topics, while in debriefing and further transfer activities, they can even explore alternative futures, what-if-scenarios, and solutions to complex problems. However, for Duke, Klabbers, Rizzi, Wenzler, García-Carbonell and others, gaming's greater potential as *multilogue communication* lies in an iterative and shared process that alters social systems and enables individual and organizational learning through gaming.

From a design-science perspective (Klabbers, 2009), gaming is realised through several feedback loops with the stakeholders and actors involved. Through debriefing, the game is (partly) accepted as a sufficient and useful model of reality and/or a next iteration of design necessary to build a "better" game model.

Regardless of whether commonalities or differences exist between the perceived reality of the reference system and the perceived reality of the game, the multilogue process in design, play and debriefing will lead to a better and new understanding of the reference system. In this way, the iterative process of gaming itself offers the opportunity to understand and (re)construct complex systems, processes, situations, problems and interrelations and to create ideas for their transformation and overcoming. Gaming simulation as utopia and uchronia supports the creation of new innovative solutions and visions for an alternative future and the modelling of a process according to which concrete socio-technical systems' transformation can be successfully implemented. Players as actors can assume and interpret multiple roles

and represent the social organisation of the referent system, explore the multiple meanings and change options for a set of corresponding rules and build alternative futures for the use of a set of resources embedded in and influencing time and space.

8.2 Time Horizon and Treatment of Time in Different Game Forms Due to the Level of Aggregation and Abstraction

The *cone of abstraction* was also originally developed by Duke (1974). This model suggests that different forms of simulation games can be classified and understood through the illustration of an upside-down ice cream cone, which represents a continuum ranging from low to high levels of abstraction (see Fig. 8.1; Kriz, 2022). If you slice it at the top, according to Dick Duke, the game is more abstract and metaphorical. Games are qualitative models of the reference system. The deeper down you go, the more details are added to the game, making it less abstract. Here, games represent more quantitative data and models of the reference system, and thus they are more in accordance with, or have high face validity, regarding the perceived reality. In a series of interviews, Jan Klabbers (see Kriz, 2022) pointed out that from his perspective, the main question in game design is concerned less with the appropriate level of abstraction than it is with determining the appropriate level of aggregation. However, the idea of the cone can still be applied to describe different levels of aggregation (adding more detail and complexity as a form of disaggregation). Burges (1995) proposed measuring complexity in games using four main variables: the number of decisions players must make, the number of people per playing group, the number of teams or different groups in the game, and these three variables in relation to the cycle time (e.g., duration of around of play) within which players must make their decisions. Of course, complexity may change during the course of gameplay, but games on a lower level of aggregation generally

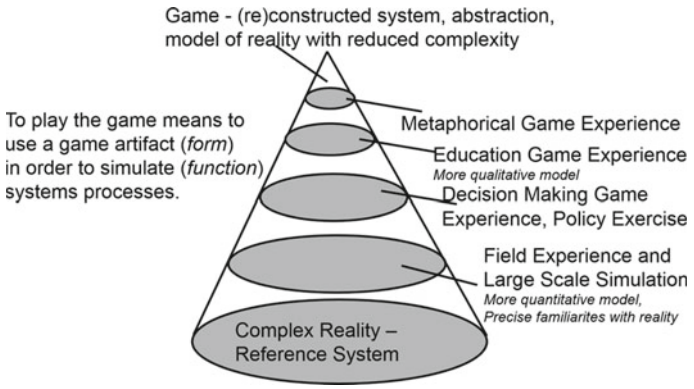

Fig. 8.1 Different forms of gaming models (own illustration based on Duke, 1974; Duke & Geurts, 2004)

include more actors, rules, and roles and more simulated forms of resources, system elements and interrelations, and thus complexity is increased.

The need to reduce complexity, particularly in games that are designed as a form of education, leads to a conflict between the demand for a realistic representation of reality and a learning-oriented reduction of issues that is comprehensible to game users (Kriz, 2022). According to Capaul and Ulrich (2003), the solution lies in clearly defining the (learning) objectives that the simulation game sets out to achieve and defining the level of abstraction required for this. According to Tsuchiya (2012), simulation games should be as abstract as possible while keeping in mind that all games need reflection on and comparison of the game and real worlds in the debriefing. Debriefing has many more additional functions and issues and is crucial for transforming the game experience into learning.

The concept and classification of the cone model are important for the time horizon and for the simulation of time in different types of games. According to Klabbers' understanding of the cone of aggregation, at higher levels of aggregation, the time horizon is typically more connected to a strategic level of decision-making, and a longer timespan is the focus of the simulation game (e.g., years or decades). At lower levels of aggregation, and through integration of greater detail and complexity into the game model, the level of decision-making and acting is more connected to an operational and behavioural level, and the simulated timespan is usually shorter (e.g., days or hours). It is important to understand that the simulated timespan differs from the playing time. For example, we can simulate a system process that encompasses many real-world years within a single hour if the game is at a highly aggregated level.

If Duke's original cone model is applied, games that correspond with a high level of abstraction are more metaphorical and qualitative. Many policy games and educational games fall into this category. Here, the playing time of the game itself is often short (from only a few minutes in highly metaphorical games to 1–2 days in typical educational simulation games), as these games do not require many resources in terms of material, number of players, space, or time. Time itself is often a qualitative construct: for example, no direct correlation exists between playing time and real time in the reference system. Players in a typical business game may have 1 h in a round-based group setting to make a list of decisions.

The decisions are then input within a few minutes into a software/app-supported simulation model, and within seconds, the decisions' effects are calculated. In traditional business games, such a round of play typically represents one business year or one financial quarter of a year. The use of time as a form of "batch processing" (Lainema, 2010) here is not a realistic representation of the flow of time in reality, but from a pedagogical perspective, with a focus on decision-making and experience of the decisions' effects, it can make sense. As we progress downward through the cone to lower levels of abstraction, games become increasingly complex and detailed and exhibit increasingly quantitative and precise familiarities with the simulated and perceived realities of the reference system. Here, for example, we find behavioural simulation games and games designed as training for firms and the military, or disaster-control exercises. Time flow in these games is typically designed to be continuous processing or a form of real-time gaming (Chiesl, 1990).

Quantitative data are used and produced, and at a very low level of abstraction, the game time corresponds exactly to real time (i.e., 1 h in the game is equal to 1 h in the real world) or to some kind of quasi-real time (e.g., every 10 s of the game represents 1 day in the real world or other mappings of time relations). Lainema (2010) argued that a continuous flow of time in a simulation game may allow the achievement of objectives not possible in batch-processed simulation games. Real-time gaming (or continuous gaming) appears more immersive and popular from an entertainment perspective (and is therefore widely used in entertainment and commercial video games) but also represents authentic activity and complexity in the learning context.

Continuous processing of time seems to be more accurate and realistic, particularly in a business world that is itself increasingly becoming an agile and process-oriented kind of organisational work and decision-making process. Nevertheless, a high degree of realism is not always linked to better learning. First, high complexity and extensive detail may overburden players and ultimately lead to less engagement, motivation, role-taking and learning (Kriz, 2003; Kriz & Eberle, 2004; Kriz & Hense, 2006; Kriz & Auchter, 2016). Second, a game's perceived fidelity and realism may be high even in highly abstract and metaphorical games and low in highly detailed and complex games (Kriz, 2022).

Thavikulwat (1996) observed that the treatment of time in simulation games can differ across three dimensions: fixed versus flexible scaling (the focus is on how time is segmented in the game), synchronised versus unsynchronised play among the participants and driven in different ways (either by the facilitator, by the participants, the clock or the level of activity). According to Thavikulwat, all $2 \times 2 \times 4$ possible combinations have different advantages and disadvantages and can make sense from a pedagogical perspective. Ultimately, the target group's learning objectives are relevant in the selection of one of several options for how time is treated in simulation games. Higher education focuses on the development of competences, amongst them, critical thinking. Critical thinking encompasses logic, creativity, responsibility, ethics and metacognition, as well as the key competence of life-long learning (Daniel et al., 2005). Pacing plays a central role: if time moves fast, participants' decision-making is based more on emotions and gut-level attitude and less on thorough analysis and critical thinking. If time moves continuously, it may become more consequential, compared with other teams, when participants make decisions in competition-based games.

8.3 Examples of the Treatment of Time as Content in Simulation Games

In this section, I wish to provide brief examples of games to demonstrate that it is necessary in some learning environments to integrate and vary different time scales and treatments within the same game, because time itself, or dealing with time as a resource, may be among the game's key content features and learning objectives.

To begin with a highly metaphorical little game at the top of the cone, as an example, we can draw on a game conceived by Dmitry Kavtaradze. Participants must close their eyes and inwardly count the seconds between acoustic start and stop signals given by the facilitator. After the stop signal, they open their eyes again and state the number of seconds they have counted. The facilitator uses 1 min for the objective duration, but participants' results may vary considerably, typically ranging between 30 and 90 s (the minimum that I myself experienced was 17 s and the maximum was 156 s). This game should highlight the fact that, like every human perception, perception of time does not reflect an objective reality but rather is subjectively influenced and reality is subjectively constructed. Here, the short-gamified exercise serves mainly as a metaphor.

Numerous games intentionally involve high-time stress to demonstrate the effects of stress and workload on behaviour, emotions, thinking or decision-making, etc. In business gaming, for example, new state-of-the-art games are developed on an ongoing basis that focuses on supply-chain management and project management, in which time itself is a crucial resource. For example, Park (1995) described the application of a just-in-time logistics game for effectively supporting the change process implemented by a company to transform its production- and supply-chain processes. In a project-management game of my own design (SysTeamsProject; Kriz et al., 2013), the game time follows a relatively uncommon sequence of rounds that are composed of the same structure or sequence of steps. It simulates different phases to reflect the different phases of project management (e.g., the initiation and concept phase, planning phase, execution phase, etc.). Some phases, such as the concept phase, use batch processing for certain steps, events and tasks of play. Other phases, such as the execution phase, use continuous quasi-real-time processing; here, every week in reality is represented by a 10-min timeslot in the game, and on the Gantt chart as a game board, the time units used for planning the work packages are weeks and 10-min units. During play in this phase, the players are working against the clock.

As models of reality or reference systems, games are images of a moment in time. As larger social systems (e.g., organisations, societies) constantly evolve and transform, games that simulate these systems' contents and elements change accordingly. To revisit the example of the area of project management, we can observe in reality a shift away from classic project-management methods to new agile project-management methods. Accordingly, games are increasingly developed to simulate these agile and self-organised business environments.

The same phenomenon can be stated, for example, in relation to the current worldwide COVID-19 pandemic. New games are created as tools that simulate the dynamics of a pandemic along with the human decision-making and management processes associated with such health crises. Moreover, as playful animals, we socially create, construct and reconstruct our "real" world through gaming and various forms of play.

Adopting a social system perspective on gaming, Klabbers (2009) refers to rules, actors and resources as the main building blocks of games. Therefore, it is clear that in a time during which resources and their allocation (e.g., masks, vaccines, hospital

beds, etc.) and the rules of interaction (e.g., social distancing rules and lockdowns) all change, we also observe a transformation in how we regard the actors in our social organisation/society (Kriz, 2020). This creates a kind of feedback loop between gaming as design-in-the-small and social system change as design-in-the-large. For example, in one of my own simulation games dealing with change management in hospitals (*SysTeamsChange*, Kriz & Hansen, 2020), these actual changes in reality again altered the play and facilitation of the game.

In several games with learning objectives aimed at understanding issues of long-term sustainability, different treatments of the issue of time may be appropriate within the same game. Barreteau and Abrami (2007) described the design and use of a simulation game (the *PIEPLUE* river basin management game) and the underlying approach for the management of natural resources and river management. For the simulation of time aspects, they developed a simulation model based on a combination of role-play gaming and agent-based modelling techniques. To meet the game's objectives, they had to combine the participants' use and experience of four different time scales:

- The operational time scale deals with resource-use practices, which are typically at the day time scale or even shorter.
- The strategy time scale deals with the design of strategies guiding these practices, which are typically seasonally based. These strategies constitute the basis for determining choices at the operational time scale level.
- The constitutional time scale deals with investments or collective rule design, which have a longer characteristic time of several years. This is the time of the constitutional choices that frame strategy design at the strategy time scale level.
- The resource time scale deals with resource dynamics, which are not hierarchically linked to others, but for some resources, such as forestry, might even reach several dozens of years.

Another interesting example is *triCO$_2$lor*, a UNESCO award-winning game designed by Ulrich (2008), which deals with climate change and other topics pertaining to climate, global warming, energy use, etc. Here, multiple players represent different generations (children, parents and grandparents). This game highlights one of the key didactic strengths of all simulation games: the ability to simulate and demonstrate the long-term effects of decisions in a sort of time-lapse and immediate feedback loop. This supports the learning process from a pedagogical perspective (De Caluwé et al., 2008; Kriz, 2013). In the game, through interactive role-play and simultaneous simulation in three different cohorts, the long-term effects of decisions on future generations and the cause–effect relations between generations become transparent, and an emotional and embodied experience that offers opportunities for awareness-building and learning ensues.

8.4 A Critical Warning from the Field of Business Games

As stated above, dealing with sustainability and long-term effects is among gaming's vital learning objectives and strengths. In many business games, players in the role of managers have to deal with the issue of forgoing short-term profits for long-term results. Such an important issue for real business strategies and sustainability can hardly be addressed in business games that run only a few periods (e.g., playing rounds) and that simulate only a short timespan. There must be sufficient playing and debriefing time to explore and experience short-term behaviour and long-term side effects in the simulation game (Ford & McCormack, 2000). It should also be considered that the prediction of simulation outcomes, particularly in competitive business games, is influenced by playing and debriefing time (Gosenpud, 1989).

The following example and warning are based on Richard Teach's work on "business games as false prophet" (1990) and from personal communication and interviews with him (Kriz et al., 2022). Most business games played worldwide are based on the rigid, highly reductive, and outdated models of the traditional free-market economy, mainly dealing with competition in markets for customers and a preference for cost-leadership strategies to win, leaving out the supplier side, etc. They cannot implement sustainability practices, etc., simply because the game's reductive model does not allow such decisions, and moreover, because most games are played within four to six rounds of play. Therefore, most rigid-rule business games are biased models of reality that follow narrow economic narratives. Sustainability would require longer periods of gameplay and a longer simulated timespan of several years for impacts to become apparent. In the format in which most business games are designed and played, only short-term profit-oriented strategies increase the chances of "winning" the competition.

Another weakness of traditional business games is that they use mainly batch processing (round-based, with the main part of the playing time used for decision-making; see above) and not enough real-time processing phases. "Time stands still" while the teams are implementing their decision strategies. Time then jumps forward at the end of each round. Players cannot observe or understand the impact of interactions between their decisions regarding the simulated systems' variables and competitors' decisions regarding those variables until the round is complete and/or at the beginning of the next round of play. Therefore, decisions are always based only on past data and on what happened in the preceding rounds and are not sufficiently based on current events (Feinstein et al., 2002; Lainema, 2010).

In an even more critical sense, games of this nature can be regarded as unconsciously manipulative (Kriz et al., 2022). Through these games, participants are educated in matters relating to business and economics, but only to the extent that this education aligns smoothly with specific consumption-oriented mainstream and neo-liberal policies. Here, the manipulation is subtle, unconscious and hidden, as many sponsors, designers and facilitators themselves believe in the correctness of this economic paradigm and way of life.

A further problem emerges for reasons other than the limited design of the underlying business model: many facilitators lack any strategy for dealing with playing teams that must declare bankruptcy in traditional business games. Consequently, facilitators tend to provide conscious or unconscious support, particularly for teams that fail to make good decisions. Adopting the role of the bank, facilitators give unlimited loans to keep teams and participants in the game. Participants' engagement in high-risk decisions is supported, and the learning effect may be that managers can evade responsibility for their decisions because someone will bail them out. More alarmingly, the stated weaknesses of traditional business games persist in the debriefing because the narrow model is not challenged against the perceived reality. Designers, facilitators and participants may confuse model and reality and believe that the game is ontologically true and fully representative of reality. They may believe that winning a game demonstrates learning. Many business schools even grade and assess students based exclusively on their game results. Students who achieve better financial results in games are awarded higher grades despite having participated in no debriefing or reflection on the games' underlying assumptions and models. In this way, the use of such games becomes unethical, the game model remains a black box, and—intentionally or unintentionally—the game is merely a terribly biased propagandist medium (Kriz et al., 2022). One of the most significant problems here is associated with the fact that the simulated timespan of the reference system's model is too short and the participants' playing and debriefing time is also inefficiently short. Failure to treat time appropriately in gameplay and debriefing deprives players of opportunities to trial and understand sustainable long-term strategies and decisions' effects.

8.5 Practical Suggestions for the Use of Time in Briefing, Gameplay, Debriefing and Evaluation of Games

It is not possible to offer specific recommendations as there are too many different game formats, learning objectives and target groups. Only some basic principles can be derived from empirical results, personal experiences and interviews with experts in the field. If we examine the application phase of gaming as a process, we can roughly differentiate phases of briefing, gameplay, debriefing and evaluation. A more detailed investigation of applications' processes reveals that these phases are not always separate and consecutive steps and time blocks. From a pedagogical perspective on the use of gaming simulation for education and learning, it often makes more sense to interlace the corresponding processes. For example, several short briefings could be held for different phases in a game, together with spontaneous interim debriefings and transfers and formative evaluation measures implemented in the flow of game-based activities (see also Chap. 7 de Wijse-van Heeswijk & Kriz, 2022, in this book; Schwägele et al., 2021).

From a more pragmatic and practice-oriented point of view, there is widespread agreement that the briefing and introduction phase prior to gameplay and the summative evaluation after gameplay should be kept as short as possible (e.g., interview with Sivasailam Thiagarajan). Usage of time for instance for introduction should be limited because of various reasons. Participants will loose interest if introductions are too long and/or elaborate and then participants might not immerse in the gameplay and role-taking in a way that contribute to their learning goals. As a rule of thumb, these could each account for around 5–10% of the total activity time.

If more time is needed and impossible to allocate (for example, if the fixed time in a classroom setting is too short and the game is comparatively too complex and needs to consume more of the duration), the briefing and evaluation can be partly shifted to a preparation and post-processing time with clear instructions and prepared material (e.g., briefing texts on roles, rules, and the game's purpose, completing written questionnaires, etc.). Although briefing has to be kept short it is nevertheless important to guarantee smooth simulation game dynamics and the briefing must be connected with the learning outcomes (what do facilitator and players expect that participants may learn?). This also leads directly to the debriefing design (see below), and in practice, the debriefing is the main process for transforming the gameplay experience into learning and transfer. Therefore, debriefing requires a large amount of the total time of gaming as meaningful learning environment (see below; Tipton et al., 2015).

For gameplay, on the one hand, time on task is important for learning effects (and realisation of long-term effects as stated before; Hense et al., 2009). On the other hand, debriefing time is even more critical and linked to learning effects. Empirical studies have also demonstrated this (Kikkawa et al., 2019; Kriz & Auchter, 2016). The duration of play and debriefing is essential, as well as how the time is used in the sense of professional facilitation (de Wijse-van Heeswijk, 2021; Kriz, 2010; Leigh & Spindler, 2005). If the game is not carried out in one coherent block of time (e.g., a full-day workshop setting) but is separated into several smaller time blocks (e.g., a round of 1 h every week for a duration of one or more months), it is crucial to assign additional integrated homework for preparation and debriefing purposes and to allow participants to remain somewhat immersed in the process of thinking and connecting to the game in the interim.

Based on interviews with experts, personal experience and the design of didactic game-based settings, it seems appropriate to reserve at least as much time for debriefing activities as for pure gameplay activities (50–60% time for debriefing). So, if you have, for example, 1 h of time, you could use approximately 5 min for briefing, 5 min for evaluation, 20–25 min for gameplay and 25–30 min for debriefing). In one of my own business games, *SysTeamsChange*, the total duration is around 15–16 h, while the actual playing time is only around 4 h. Approximately 60–70% of the time is used for debriefing and transfer.

As stated above, if a simulation game is more complex and even uses the advantages of a partially real-time scenario, it makes sense from a didactic perspective to interlace phases of debriefing and gameplay. In batch-processing games, this occurs naturally after each round of play, allowing some time for intermediate

debriefing. In general, batch processing gives participants a greater opportunity to adapt to a monochronic approach to working, thus performing one or several tasks at a time. In continuous processing, the work is more polychronic, requiring participants to pay attention to several tasks in parallel. Additionally, continuous processing gives less time to fully complete tasks, making the experience more urgent and stressful, and may even force players to focus on many short-term decisions (Lainema, 2010). For a meaningful learning environment, real-time games must be paused for time-out breaks. These breaks give participants opportunities to more carefully reflect on their own behaviour, analyse situations, engage in higher levels of planning and decision-making and benefit from long-term critical thinking.

The use of the debriefing time itself should follow the principle that all participants must be given the opportunity to reflect and simultaneously discuss and articulate their own emotions, thoughts and learning. For example, if the debriefing time is short and the group large, it makes little sense to hold a debriefing with a full group (e.g., all seated in a large circle) of participants, only a small number of whom will have an opportunity to say something. In such cases, it is more efficient, for example, to split the entire group into smaller groups and assign debriefing tasks for discussion and to give many participants the opportunity to discuss points simultaneously and actively. This means that the debriefing phase, especially, requires a rigorously planned variety of methods and facilitated temporal choreography (Kriz, 2010). Furthermore, from the content-related perspective, it is necessary to give participants the opportunity to discuss what-if-scenarios and possible alternative futures and to draw their own lessons learned and generate ideas and consequences for their own changed thought and behaviour patterns. The experienced game model must be compared with the perceived reference system, and this comparison must specifically include the dimensions of simulated timespan, short-term behaviour, and long-term effects. In this way gaming's full potential can be exploited to construct utopias and uchronias and to create an impact for the change and design of a desired reality.

8.6 Wrap-Up Conclusion

Time is a multifaceted issue in relation to simulation gaming. Simulated timespan, time and timing in the gameplay, briefing and debriefing influence learning and the flow of the game-based experience. Time can only partly be designed for instance in the structuring and allocating of time to game rounds and/or continuous simulation approaches, scenarios but also the intro, preparation and debriefing time come into play. Time is an experience, an alternate reality recreated in the minds of players, time can fly, time can last forever and time in simulation games can bring you into the future times and places (uchronia and utopia). As long as there is enough time to enable meaningful gameplay and time to reflect on and learn from

simulation games (possibly even long after the gameplay), time is used as a powerful vehicle for learning and sense-making to prepare ourselves for possible alternative futures.

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References

Barreteau, O., & Abrami, G. (2007). Variable time scales, agent-based models, and role-playing games: The PIEPLUE river basin management game. *Simulation & Gaming, 38*(3), 364–381.

Burges, T. F. (1995). Cycle time, decisions, and complexity in business simulation/games. *Simulation & Gaming, 26*(3), 376–383.

Capaul, R., & Ulrich, M. (2003). *Planspiele. Simulationsspiele für Unterricht und Training*. Tobler.

Chiesl, N. E. (1990). Interactive real time simulation. In J. W. Gentry (Ed.), *Guide to business gaming and experiential learning* (pp. 141–158). Nichols/GP.

Daniel, M. F., Lafortune, L., Pallascio, R., Splitter, L., Slade, C., & De La Garza, T. (2005). Modeling the development process of dialogical critical thinking in pupils aged 10 to 12 years. *Communication Education, 54*(4), 334–354.

De Caluwé, L., Hofstede, G. J., & Peters, V. (2008). *Why do games work?* Kluwer.

De Wijse-van Heeswijk, M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming, 52*(3), 312–332.

De Wijse-van Heeswijk, M., & Kriz, W. C. (2022, in press). A design science perspective on formative evaluation in simulation games. In M. L. Angelini & R. Muñiz (Eds.), *Simulation applications in education: Towards a collaborative approach to teaching and learning*. Springer.

Duke, R. D. (1974). *Gaming, the future's language*. Sage.

Duke, R. D., & Geurts, J. (2004). *Policy games for strategic management*. Dutch University Press.

Duke, R. D., & Kriz, W. C. (2014) (Eds.). *Back to the future of gaming*. W. Bertelsmann Verlag.

Feinstein, A. H., Mann, S., & Corsun, D. L. (2002). Charting the experiential territory: Clarifying definitions and uses of computer simulation, games, and role play. *Journal of Management Development, 21*, 732–744.

Ford, D. N., & McCormack, D. E. M. (2000). Effects of time scale focus on system understanding in decision support systems. *Simulation & Gaming, 31*(3), 309–330.

García-Carbonell, A., Rising, B., Montero, B., & Watts, F. (2001). Simulation/gaming and the acquisition of communicative competence in another language. *Simulation & Gaming, 32*(4), 481–491.

Gosenpud, G. (1989). The prediction of simulation performance as it is affected by time. *Simulation & Gaming, 20*(3), 319–350.

Hense, J., Kriz, W. C., & Wolfe, J. (2009). Putting theory oriented evaluation in practice: A logic model approach for the evaluation of Simgame. *Simulation & Gaming, 40*(1), 110–133.

Kikkawa, T., Kriz, W. C., & Sugiura, J. (2019). The effects of debriefing on the performance and attitude of Austrian university students and cultural differences to Japanese students. In R. Hamada, S. Soranastaporn, H. Kanegae, P. Dumrongrojwatthana, S. Chaisanit, P. Rizzi, & V. Dumblekar (Eds.), *Neo-simulation and gaming toward active learning* (pp. 515–524). Springer.

Klabbers, J. H. G. (2009). *The magic circle: Principles of gaming & simulation*. Sense Publishers.

Klabbers, J. H. G. (2018). On the architecture of game science. *Simulation & Gaming, 49*(3), 207–245.

Kriz, W. C. (2003). Creating effective interactive learning environments through gaming simulation Design. *Simulation & Gaming, 34*, 495–511.
Kriz, W. C., & Eberle, T. (2004) (Eds.). *Bridging the gap: Transforming knowledge into action through gaming & simulation*. Sagsaga.
Kriz, W. C., & Hense, J. (2006). Theory-oriented evaluation for the design of and research in gaming and simulation. *Simulation & Gaming, 37*(2), 268–283.
Kriz, W. C., & Hansen, H. (2007, 2020). *SysTeamsChange. Planspiel zur Simulation von Organisationsentwicklung und Führung im Change Management. Version Health 2020*. riva.
Kriz, W. C. (2010). A systems-oriented constructivism approach to the facilitation and debriefing of simulations and games. *Simulation & Gaming, 41*(5), 663–680.
Kriz, W. C. (2013). Erwerb von Systemkompetenz mit Planspielmethoden. In H. Bachmann (Ed.), *Hochschullehre variantenreich gestalten. Ansätze, Methoden und Beispiele rund um Kompetenzorientierung* (pp. 106–136). hep Verlag.
Kriz, W. C., Hermann, K., & Eiselen, T. (2013). *SysTeamsProject. Planspiel zur Simulation von Projekt- und Ressourcenplanung und Projektdurchführung*. riva.
Kriz, W. C., & Auchter, E. (2016). 10 years of evaluation research into gaming simulation for German entrepreneurship and a new study on its long-term effects. *Simulation & Gaming, 47*(2), 179–205.
Kriz, W. C. (2020). Gaming in the time of COVID-19. *Simulation & Gaming, 51*(4), 400–407.
Kriz, W. C. (2022, in press). Knowledge from the great ancestors: The "cone of abstraction". A concept revisited based on interviews with veterans of gaming simulation. In T. Kikkawa, W. C. Kriz, & J. Sugiura (Eds.), *Gaming as a cultural commons. Risks, challenges, and opportunities*. Springer.
Kriz, W. C., Kikkawa, T., & Sugiura, J. (2022, in press). Manipulation through gamification and gaming. In T. Kikkawa, W. C. Kriz, & J. Sugiura (Eds.), *Gaming as a cultural commons. Risks, challenges, and opportunities*. Springer.
Lainema, T. (2010). Theorizing on the treatment of time in simulation gaming. *Simulation & Gaming, 41*(2), 170–186.
Leigh, E., & Spindler, L. (2005). Congruent facilitation of simulations and games. In R. Shiratori, K. Arai, & F. Kato (Eds.), *Gaming, simulations, and society* (pp. 189–198). Springer.
Park, P. S. (1995). Simulation in just-in-time implementation. *Simulation & Gaming, 26*(1), 51–59.
Rizzi, P. (2014a). *On the nature of gaming simulation*. scriptum.
Rizzi, P. (2014b). Between no place and no time. In R. D. Duke & W. C. Kriz (Eds.), *Back to the future of gaming* (pp. 59–65). W. Bertelsmann Verlag.
Schwägele, S., Zürn, B., Lukosch, H. K., & Freese, M. (2021). Design of an impulse-debriefing-spiral for simulation game facilitation. *Simulation & Gaming, 52*(3), 364–385.
Thavikulwat, P. (1996). Activity-driven time in computerized gaming simulations. *Simulation & Gaming, 27*(1), 110–122.
Tipton, E., Leigh, E., Kriz, W. C., & Crookall, D. (2015). Debriefing: The real learning begins when the game stops. In T. Kaneda, H. Kanegae, P. Rizzi, & Y. Toyoda (Eds.), *Hybrid simulation and gaming in the networked society* (pp. 1–3). Jasag.
Tsuchiya, S. (2012). Policy exercise for organizational transformation: A double-loop learning perspective. *Japan Journal of Gaming Simulation, 22*, 69–76.
Ulrich, M. (2008). *triCO2lor*. UCS.

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Part II
Simulation-Driven Proposals

Interactive Courses and Assignments Using Simulation and Gaming in the COVID-19 Era

9

Toshiko Kikkawa

Overview

In this chapter, the author introduces an approach to teaching online courses in the COVID-19 era while preserving interactivity in classes and assignments. Due to the pandemic, Japanese universities have had to hold classes online. Accordingly, the author conducted courses online while trying to maintain interactivity in classes. Two practices are introduced here, one involving the use of games in classes and one employing writing assignments and feedback. Face-to-face games were successfully translated into online games using ZOOM®. The games used in online classes included interactive lecture methods using Thiagarajan's (Thiagi's) methods, traditional simulations and games, and commercial games. Thiagi's methods were incorporated into reports regarding lecture material for on-demand courses. In this chapter, the author briefly introduces the procedures and characteristics of original games, followed by a technique for modifying face-to-face activities into online games or writing assignments. After nearly 2 years of practice, the author concludes it is possible to retain interactivity in a class setting, without physical presence.

Keywords

Interactive courses · Simulation and gaming · Online courses · Writing assignments · Thiagi's methods

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Learning Objectives

The reader should be able to:

- Understand the use of face-to-face games in classes using ZOOM®.
- Explore the potential of games in online classes and interactive lectures.
- Learn the procedures and characteristics of the original games, followed by a technique for translating face-to-face activities into online games or writing assignments.

9.1 Introduction

Since the onset of the COVID-19 pandemic, Japanese universities have had to hold all courses online. Before COVID-19, I used face-to-face games for didactic purposes. The new challenge was twofold: transforming face-to-face games to online games and maintaining interactivity in large-sized online classes, where conducting games is impossible.

In Sect. 9.2, I will introduce games that can be transformed into online games and provide concrete examples of these. The transformation is relatively simple in classes of around 30–40 students. However, it is impossible if the class size is over 100. In the latter case, the author tried to preserve interactivity by using interactive assignments, which will be introduced in Sect. 9.3. In the individual sections of this chapter, I will introduce several examples of the games I used. First, I summarize the procedures of the games. Then, I describe how I transformed them into online games or assignments.

Let me briefly explain the educational situation at Japanese universities. The number of students in a course is generally larger than in other countries, especially in private universities. It is common to have over 100 students registered, and it is not rare for a course to have over 600 students. Therefore, the classes inevitably adopt a lecture-style teaching method where students passively join the classes and little or no interaction occurs among students, even though interactive methods could be applicable if simulation and gaming were used. I regularly included games in large classes as well as in smaller classes of up to 50 students.

Japanese universities have two semesters per year. Each semester consists of 15 class meetings, and each class lasts 90 min. In 2020, Spring semester started later than usual (April), as universities had not prepared online courses when the first lockdown started in March 2020. Therefore, many universities had to reduce the number of classes for the semester to 12 or 13. This inevitably required changes in prepared syllabi to coordinate online courses with a reduction in the number of class meetings.

9.2 Transforming Face-to-Face Games into Online Games

In this section, I introduce real-time classes using ZOOM®, transforming face-to-face games into online games. Some face-to-face games are easily transformed into online games, without any changes to the rules, whereas others require rule changes, sometimes minor, when played online. I adopted commonly used training games and commercially available games (i.e., sold in shops). In the latter case, I prepared enough copies of the games for students even when one or a few copies would be enough to play the game online. This, I think is very important for avoiding violation of copyrights.

The course was "Social Psychology" and focused especially on communication. Therefore, games were selected that touched on perspectives related to communication. I recognize that many existing games can be played with no or slight modifications to the online rules.

In the following subsections, I will introduce four concrete examples taken from 15 classes. One is from the interactive methods developed by Thiagarajan (termed "Thiagi's methods" hereafter), and three are commercially available games. All deal with issues of communication and debriefing, with lectures on psychology-related concepts or theories provided by the facilitator, i.e., this author.

9.2.1 "Quick Scan"

"Quick Scan" is one of the interactive methods developed by Thiagarajan et al. (2015). It is also the name of a framegame he developed. A framegame is a training game for facilitators that allows easy loading and unloading of content, which means that the games can be used for different lecture contents.

I briefly summarize the basic process of "Quick Scan" (for more detail, see Thiagarajan et al., 2015). First, a facilitator assigns four questions to four teams, each of which is assigned a different playing card suit. Each question corresponds to a suit. Second, participants on a team are asked to collect information from those who are on a different team (i.e., who have been assigned different questions). After information collection is complete, each team shares information about the questions assigned and presents a report.

I changed the basic procedure to fit the online class using ZOOM®. I used the game at the beginning of the course, which meant that the students were not completely familiar with the functions of ZOOM®. First, I divided students into four teams without using physical playing cards, using instead an online four-sided die that Google offers online. Then, I assigned the following four questions to the students:

1. Why did you take this course?
2. What are your expectations for this course?
3. What is your experience of playing games, e.g., digital games or board games?
4. What do you want to learn by taking this course?

After each student was assigned one of the questions, I divided them into four groups using the breakout room function. The difference between the original "Quick Scan" game and mine is that students themselves answered the assigned questions. They did not collect information regarding assigned questions. In each group, students shared their answers or thoughts about the question assigned to them. When sharing ended, I made new breakout rooms with two students in each room. There, students were asked to share (in pairs) content from their group's discussions. Finally, I made new breakout rooms that differed from the first set and asked students to share the conversations they had when they were in pairs.

I had two aims in adopting the game. First, I hoped to discover students' thoughts about taking the course. Second, I hoped to encourage students who were not familiar with each other to disclose information about themselves through this form of self-introduction. "Quick Scan" is an interactive method and framegame developed by Thiagarajan et al. (2015). A framegame is a training game for facilitators allowing easy loading and unloading of content. A framegame can be used for different lectures.

9.2.2 "Ungame®" and "Black Stories®"

"Ungame®" is a commercially available game that is used not only for fun but also for training purposes. It is a non-competitive card game with open-ended questions. Some of the questions are light-hearted, whereas others are serious or require more self-disclosure.

I used this early in the course to encourage students' self-disclosure and to introduce the concept of "open-ended" questions. By playing the game, students naturally disclosed things about themselves and learned what open-ended questions were through experience.

"Black Stories®" is also a commercially available card game. Since it has gained popularity, many variations have become available in stores. Basically, any version can be used for classes. It is a game of solving riddles through deduction, e.g., discerning how a strange accident happened. One person reads a card to start the game (players assume the roles in turn), and only that person knows the answer to the riddle. This person reads a short sentence describing the accident, and other players deduce the answer by asking questions. However, these must be "yes–no" questions. In other words, it is a "closed question" game. It is also suitable for teaching lateral thinking because creating unconventional questions increases the possibility of winning.

I used "Black Stories®" after the class played "Ungame®". Connecting two classes with different patterns of questions leads to a better understanding among students of both types of questions.

Both games can be played in groups of 4–6, therefore I used breakout rooms. The only change when playing the games online is to send cards to players using the chat box in breakout rooms.

9.2.3 "Just One®"

"Just One®" is a cooperative game in which players give clues to the active player (players take the role in turn), whose goal is to guess mystery words. Players other than the active player secretly write down a clue to assist her/him. However, if some of the players write the same clues, they are cancelled before the active player is allowed to see them. Thus, the more identical clues students write, the fewer clues the active player receives. Therefore, players other than the active player must consider what other players might write as a clue. The game can be played using breakout rooms (Fig. 9.1). No change in rules is necessary. I used the game to teach the concept of "illusion of transparency" (Gilovich et al., 1998), as students naturally noticed while playing the game that their understanding of what others think was often wrong. The clues were often identical. In addition, playing several rounds led students to more correct predictions. In the debriefing session, I emphasized the importance of careful listening in communication, while being aware of the phenomenon of the "illusion of transparency". From the experience of the game, they could transfer their knowledge to real-life communication.

9.2.4 "Bring Your Own Book®"

"Bring Your Own Book®" requires that players find an appropriate phrase in response to a prompt given by a picker (players take this role in turn). The books used in the game are from participants' own shelves. Within a minute after a player announces that s/he has found a phrase, players should find a phrase in their own books. After all players present their phrases, the picker chooses the best phrase and awards the player who selected it.

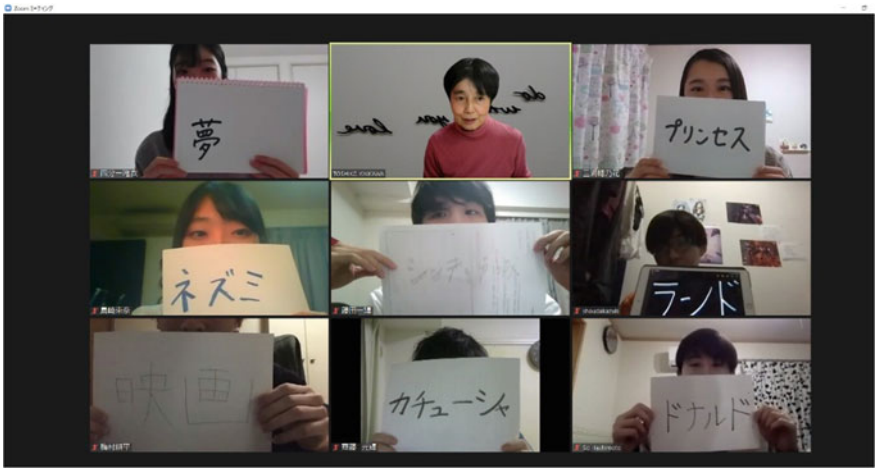

Fig. 9.1 Students were shown clues in the "Just One®" game. The mystery word for this round was "Disney"

Fig. 9.2 Students were shown the clues in the "Bring Your Own Book®" game. They took books from shelves at the beginning of the game. (Photos made by the author)

The game can be played in breakout rooms (Fig. 9.2). Debriefing in each breakout room is very important when using this game in university classes. Students naturally explain why they chose their books, which reveals something about themselves in a sense. In addition, students easily gain feedback from other students in the room. The game is fun, and these processes induce active conversation, making the game especially effective for those who feel hesitant in public and reluctant to join conversations.

Do you want to know what your students are thinking? If yes, "Quick scan" is suitable for your course.

1. How many students are in your class? If you cannot obtain enough game kits for all of them, I recommend using five of them to avoid copyright issues.
2. Are you interested in improving the communication skills of yours? students? The games I introduce here naturally promote conversation.

9.3 Transforming Face-to-Face Games into Interactive Assignments

For larger classes with over 100 students, it is impossible to have real-time classes. All classes inevitably have to be on-demand. In my case, the maximum number of students was around 400. It is rather difficult to include interactive elements in

videos or materials offered online. Therefore, I decided to maintain interactivity by introducing it into the assignments. I used this method for an organizational psychology course, though the methods are applicable to other courses as the assignments are not content-specific.

The basic idea is to use the results of students' first assignments as the next assignment. The results of the first assignments, thus, function as feedback. The concrete examples in the following sections will offer a fuller understanding of the assignments. Here I use the term "interaction" to mean not simultaneous interaction but delayed interaction or indirect interaction. I consider that one of the important elements of interaction in classes is being aware of other students' diverse thoughts and thereby expanding and deepening one's own perspective. In other words, the aim was to develop meta-cognition (see Lewis (2003, pp. 118–119) for a discussion of "theory of mind") such that interaction is achievable even if it is not identical to face-to-face interaction.

I will introduce six concrete examples. Five of them are modifications of Thiagi's interactive training methods, and I developed one myself. I used these methods in teaching the organizational psychology course, though the methods are applicable to courses other than psychology because they are not content-dependent. Thiagi's interactive training methods are originally conducted in a time frame and face-to-face. I divided the tasks included in each method to transform them to assignments and feedback. In the following sections, I first briefly describe the original games and then explain how I transformed them into writing assignments.

9.3.1 "Open Book"

"Open Book" is an interactive activity to familiarize participants with pertinent reference manuals (for details, see Thiagarajan, 2006). Thus, this activity is especially suitable for use at the beginning of courses to help students gain an overview of the textbooks.

The original game flow can be summarized as follows. (1) Participants review the textbook and then generate questions (quizzes). They write each question on an index card and write a page reference on the back of the card. It is not necessary to write an answer, as the purpose of the game is to gain an overview. (2) Working as a team, participants compete to find the reference page number when the facilitator reads the questions.

I divided the tasks into two assignments. For the first assignment, students were asked to create 10 questions by "scanning" the textbook and write a reference page number for each question. After I collected the first assignment, I selected 10 questions and created the second assignment leaving the reference page numbers blank. The second assignment naturally offered students opportunities to recognize which content other students had focused on in the textbook and review it again to answer the quizzes.

"The Fifth Sentence"

"The Fifth Sentence" is aimed at developing a synopsis, consisting of five sentences, after the lecture (for details of the procedure, see Thiagarajan, 2017). This activity can be used at any time during the course.

The basic procedure can be summarized as follows: (1) Working as teams, participants write five sentences that summarize key points of the lecture or presentation. (2) One team reads four of the five sentences, and other teams guess the sentence that was left out.

I divided this task into two assignments. For the first assignment, students were asked to write five summary sentences covering key points of a lecture. After collecting the assignments, I selected two of them to create the second assignment. For the second assignment, since most students follow the order of the lecture material when writing their five sentences, I removed the fifth of five sentences from one student report and the third from another (Fig. 9.3). The assignment was to guess the missing sentences and write them down. The process requires students to review the lecture again, taking the other students' perspective.

In the selection process, I looked for two reports that differed in their focus and key points. In other words, I selected them to make it clear that each student interprets the lecture from a unique viewpoint, even if they read the same online lecture material. This may occur in the face-to-face class situation, though students may not be aware of the fact if they do not interact.

Identify the sentence left out of the following two students' summaries.

Student A

1. In the Lego experiment, the participant created more Bionicles in the meaningful than Sisyphus condition.
2. Ignoring people's work is almost as bad as shredding it in front of them.
3. The easy cake mix was less popular than the recipes that required work, such as adding eggs and milk.
4. In the origami experiment, the participants appreciated their own work more, while the evaluators appreciated it less. The effect was larger for the "hard" instructions.

Student B

1. It is not difficult to motivate people; even a small amount of meaning can motivate them.
2. Loss of meaning reduces the joy experienced through work.
3.
4. People evaluate their work more favorably when they make more effort.
5. Self-evaluations are not the same as evaluations by others.

Fig. 9.3 Second assignment pertaining to the "Fifth Sentence" (translated into English). The video concerned motivation: https://www.ted.com/talks/dan_ariely_what_makes_us_feel_good_about_our_work?

9.3.2 "Missing Item"

The assignments sometimes include preparation. "Missing Item" (for the detailed procedure, see Thiagarajan, 2017) can be used for this purpose. The original activity is a guessing game where students in teams guess a missing item in the presentation/lecture.

For the on-demand course, I used PowerPoint® presentations with narration as course material. For one of the classes, I omitted one slide. The assignment was to make a slide based on the textbook. After I collected the reports, I collected about 30 slides from a total of 400 made by the students and added the slide I had removed from the original set. The purpose of the activity was two-fold. (1) After students got feedback from my slides and others, they could review the content of the class; (2) introducing various slides made by students again drew their attention to the existence of diverse thoughts and perspectives, based simply on the same textbook.

9.3.3 "Postcard to a Friend"

"Postcard to a Friend" (see Thiagarajan, 2006, for details) is designed to review a training session or, in this case, a class. The basic idea is very simple: to summarize the content of a learning experience in the form of a postcard.

For this assignment, I asked students to write a postcard to a friend summarizing or highlighting the content of a lecture. I selected about 40 postcards from the 400 postcards submitted. Here, I paid attention to selecting postcards that focused on different points in the lecture and that used diverse forms of expression, e.g., variations in writing style or the use of figures. Although the number of student postcards introduced was not large considering the class size, I believe they provided students with an opportunity to recognize that others would focus on different points in the same lecture and would employ diverse forms of expression.

9.3.4 "Twos and Threes"

"Twos and Threes" (Thiagarajan, 2005) is an effective game for reviewing what participants learned by having them create questions of their own. The original procedure includes creating closed and open questions, then answering questions in groups of three.

However, I used only open questions to simplify the assignment. In the lecture, I explained the difference between open and closed questions, as the lecture was related to organizational communication and these were the penultimate and the last classes of the course. Therefore, using the textbook as material for constructing review questions was very suitable as a last assignment. For the penultimate assignment, I asked students to create 10 open questions based on the textbook and lectures and to write answers to their questions. After collecting their assignments, I

Answer the following questions prepared by your classmates.

Quiz	Your answer
1. What "idiosyncratic credit" is useful for organization?	
2. Describe ways to fairly evaluate performance.	
3. Describe two ways of preventing loafing.	
4. What is YOUR leader prototype?	
5. What positive effects are expected in an organization in association with trust between a leader and their followers?	
6. Give an example showing how group decision-making is not necessarily the best approach.	
7. If you do not use "stage models" of career development, how does your perspective change regarding your career?	
8. What should you do to ensure that all members of your group are satisfied with the decision?	
9. Describe some social norms.	
10. What is the most important ability among the five that Krumboltz proposed in relation to "planned Happenstance"? Please explain why.	
11. What is the difference between "transactional leadership" and "transformational leadership"?	
12. Describe your experience with one of the symptoms of "groupthink".	

Fig. 9.4 Example of a student's work on the last assignment. Translated into English

selected 10 questions and developed the last assignment using them (see Fig. 9.4). The students' task was to answer the questions, as the answers were left blank. To complete the two assignments, students had to review the course twice, i.e., when creating their own questions and answers (the penultimate assignment) and when answering questions created by other students (the last assignment).

I chose the "Open Book" activity as a start, as it enables students to get an overview of the course. "Twos and Threes" requires a deeper understanding of what they have learned throughout the course and is thus suitable for use at the end of the course. The last assignment is shown in Fig. 9.4.

9.3.5 "Slogan Contest"

In addition to modifications of Thiagi's interactive methods, I used several new assignments with an element of interactivity. One was "Slogan Contest," which is easy to use.

In this assignment, I asked students to invent a slogan based on the content of the lecture. For example, with respect to the lecture about occupational safety, I asked them to invent a good slogan to prevent accidents in the workplace. When I taught stress management, I asked them to invent a slogan that could ease their own mind when they encountered stressful situations in the future. As these slogans are simple and short, I selected as many slogans as possible and incorporated them into a

feedback file. Inventing slogans can help students to summarize content in concise and essential terms. The process can also work as a review of the lecture when the students read others' slogans in the feedback file.

1. Do you want your students to grasp the entire concept of the course at the beginning? If so, "Open Book" is the most suitable activity. It can also be used at the end of the course for review purposes.
2. Do you want to review the content of all classes? In yes, "The Fifth Sentence", "Missing Item", "Postcard to a Friend", and "Twos and Threes" are suitable and can be applied at any time during the course.
3. Are your students familiar with the course material? If yes, "Slogan" is recommended because it requires knowledge of the course content.

9.4 Conclusion

From my almost 2-year experience of applying the interactive methods introduced in this chapter, I am now confident of their applicability. I did not introduce them in all of my classes, but I believe that readers could gain some insight into the process if they are interested in applying games in online courses.

Regarding the games introduced in Sect. 9.1, many other games could be played, and I did use many in online courses. I also used competitive games like "Battleship". However, I consider that games associated with a communication theme would be more suitable for online courses. Besides, communication games may often be more effective when played online than when played in face-to-face classes because online conversation decreases hesitation to talk in public, particularly for students who find it difficult to talk in class. Of course, face-to-face communication games will continue to have pedagogical value.

I would like to emphasize that the modification of the interactive activities to writing assignments could expand future possibilities of simulation and gaming methods in university education. Although I only have experience with their online application in university courses, I envisage how these methods can be used in other educational settings, e.g., high schools. I recognize that tangible elements and face-to-face interaction are invaluable for education. However, I believe that the possibility of hybrid methods that combine conventional educational methods and online applications could be a good lesson for us in this difficult COVID-19 era. These new ways of using games will allow students to understand the importance of communication, develop their listening abilities and provide constructive comments. They could also increase awareness of certain issues, particularly real-world ones.

References

Gilovich, T., Savitsky, K., & Medvec, H. V. (1998). Illusion of transparency: Biased assessments of others' ability to read one's emotional states. *Journal of Personality and Social Psychology, 75*(2), 332–346.

Lewis, M. (2003). The emergence of consciousness and its role in human development/In J. Ledoux, J. Debiec, and H. Moss (Eds.), The self from soul to brain. *Annals of the New York Academy of Sciences, 1001*, pp. 104–133.

Thiagarajan, S. (2005). *Thiagi's interactive lectures*. ASTD Press.

Thiagarajan, S. (2006). *Thiagi's 100 favorite games*. The Thiagi Group Inc.

Thiagarajan, S., Tagliati, T., Richter, M. S., & Thiagarajan, R. (2015). *Interactive techniques for instructor-led training*. The Thiagi Group Inc.

Thiagarajan, S. (2017). *Interactive lecture is not an oxymoron*. The Thiagi Group Inc.

List of the Games

"BLACK STORIES" moses. Verlag GmbH. Retrieved November 30, 2021, from https://boardgamegeek.com/boardgame/18803/black-stories.

"JUST ONE" Repos Production. Retrieved November 30, 2021, from https://boardgamegeek.com/boardgame/254640/just-one.

"UNGAME" Au-Vid Incorporated. Retrieved November 30, 2021, from https://boardgamegeek.com/boardgame/6283/ungame.

"BRING YOUR OWN BOOK"Gamewright. https://boardgamegeek.com/boardgame/173441/bring-your-own-book.

Toshiko Kikkawa is a professor of social and organizational psychology at Keio University, Tokyo, Japan. As a member of the International Simulation and Gaming Association (ISAGA) and the Japan Association of Simulation and Gaming (JASAG) for more than 25 years, she is interested in and has an experience of facilitating and designing games. Her expertise in psychology allows her to combine learning experiences with psychological theories and knowledge when facilitating and designing games. Her work covers a wide range of topics, such as disaster-prevention education, environmental education, career development, communication skill training, conflict resolution, and so on. She published several books about gaming in Japanese and her games gain popularity in Japan. As she is a dedicated user of Thiagi's games in her workshops, she runs a website for introducing Thiagi's works in Japanese. http://news.fbc.keio.ac.jp/～kikkawathiagi/.

A Case Study of Simulation Design in a Postgraduate Teacher Training Course

10

M. Laura Angelini

Overview

This chapter explores simulation design in the field of teacher education. Simulation creation is used as a vehicle for collaborative planning and professional learning in which future secondary school teachers in a postgraduate course learn about simulation in an EFL/ESL context and work in small groups to design a simulation scenario and its profiles. The flexible nature of simulation allows the pedagogical integration of other methodologies. In this study, flipped classroom and learning stations are used. The case study of 2 consecutive years reports the participants' perceptions about the potential of simulation to open a dialogic space where they can share ideas and consolidate learning. The objective pursued is to provide future teachers the opportunity to gain greater awareness of teaching and learning process by participating in and later creating a simulation. Thus, they become more effectively acquainted with active methodologies practices. A joint design of simulation is presented as a way to introduce simulations in foreign language classes in secondary education.

Keywords

Simulation · Flipped classroom · Learning stations · Collaborative learning · Simulation design

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Learning Objectives

By the end of the chapter, the reader should be able to:

- identify the potential of simulation from a collaborative perspective in teacher training;
- understand the value of simulation as a methodology to enhance dialogic learning;
- comprehend the concatenated functioning of active methodologies;
- identify some pitfalls of EFL/ESL instruction in secondary school through the future teachers' comments.

10.1 Introduction

Teacher education has experienced significant changes in Europe. Traditionally, teacher training has been perceived to be the sole responsibility of universities. However, the demands for highly qualified and versatile teachers, in accordance with the Bologna Declaration (1999), call for the development of curriculum design inspired by deep-learning principles. Deep learning promotes the qualities and competences teachers need by building complex understanding and meaning rather than focusing on accumulative knowledge that can today be gleaned through search engines, as the European Higher Education Area (EHEA) clearly states. This context justifies the need for a methodological change in teaching practices. Today's teachers need to be trained to try learning methodologies themselves, compare and contrast the methodological fundamentals and their implementation, and design integrative proposals for classroom intervention. Simulation in this study is used as a journey future teachers undertake to develop teaching competences from experimentation to simulation creation.

Although it is true that there is a relatively short tradition of simulation in teacher preparation (Flanagan & Nestel, 2004 in Al-Elq, 2010), there is already sufficient literature about the great potential of simulation in the development of professional competences: dialogic learning, teamwork, negotiation, decision-making, and the development of interpersonal relationships (Asal & Blake, 2006; Blum & Scherer, 2007; Ekker, 2004; Ekker & Sutherland, 2009; Sutherland, 2000, 2002, among others).

Simulations create a complete environment within which students interact to apply previous knowledge and practice skills related to their discipline. Simulations also serve as models for teachers to demonstrate the integration of different methodologies as they move from the briefing phase (flipped classroom, task-based learning, webquests, class debate...) to the action (simulation) to the debriefing phase (reflective learning, focus group). Through simulation, teachers integrate multiple teaching goals in a single process (Angelini, 2016, 2021; Angelini & García-Carbonell, 2019; Angelini et al., 2015; García-Carbonell, 1998; García--Carbonell & Watts, 2012; García-Carbonell et al., 2001, 2012; Wedig, 2010).

Simulations provide opportunities for active participation to develop interactive and communication skills and link knowledge and theory to application (Hertel & Millis, 2002).

The gains of simulation applied to language learning are discussed at length by Crookall and Oxford (1990) and García-Carbonell et al. (2001). Advantages include the immersion in language learning through meaningful situations, immediate feedback through teamwork, constant interaction, and lower anxiety. Empirical research conducted by Angelini (2012), Angelini and García-Carbonell (2019), García-Carbonell (1998), García-Carbonell and Watts (2012), García-Carbonell et al. (2001), and Rising (1999, 2009) supports the effectiveness of simulations in the development of communicative competence in English as a foreign language (EFL).

For example, there is qualitative research based on students' perceptions after a telematic simulation. Watts et al. (2011) found that students' motivation increased during the simulation and that their interpersonal skills were reinforced. Andreu-Andrés and García-Casas (2011) found that students had fun while learning. Woodhouse (2011) demonstrated that a computer-assisted simulation greatly helped EFL students to consolidate linguistic structures as well as professional skills such as negotiating, decision-making, and working collaboratively. Angelini and García-Carbonell (2014) also corroborated the effectiveness of simulation and gaming in improving oral proficiency in EFL along with the development of student responsibility and the generic skills mentioned above. Thus, in light of the virtues that simulations have to offer in teacher education, this study poses the following research question:

Research Question: Can the creation of simulation scenarios be an effective way to introduce simulations as a classroom technique?

10.2 Methodological Integration

Future teachers of a postgraduate course on teaching methodologies are presented with a simulation scenario to analyze. They follow the conventional procedure: a briefing phase in which the scenario is studied and the problems are identified. Teams of five members are created and profiles are assigned. The teams go through the simulation phase to deal with the several challenges presented and try to find thorough solutions in light of the research they have previously conducted in the briefing phase. Debriefing unfolds as expected, first intra-group reflections on their involvement and participation, their learning and perceptions. So far, future teachers have experienced simulation by doing it themselves. The shift in the proposal comes when these future teachers are now asked to create their own simulation scenarios and profiles to be applied to secondary school students.

Following the flipped classroom model, future teachers are first presented with specific literature on simulation. By flipping the classroom, we invert the traditional teacher-centered method, delivering instruction online outside of class time and bringing simulation discussion into the classroom (Strayer, 2007, 2012; Tourón et al., 2014; Tucker, 2012). In this way, the flipped model uses educational technology to deliver theory and background materials and serves to promote class time economy.

10.2.1 Flipped Learning and Classroom Dynamics

It is important to identify the main pillars flipped learning relies on to be able to apply it properly. According to the Flipped Learning Network30, to engage in the flipped model, teachers must incorporate a flexible environment in and out of class, a learning culture, intentional content, and professionalism.

Creating a flexible environment involves rearranging the classroom design. In our case, there are four learning spaces or corners, in which future teachers in teams deal with different tasks.

As our main interest is to introduce simulation as a teaching strategy to enhance English learning, the classroom learning corners delve into discussion meeting points:

(a) *briefing:* how can you engage your students to participate in a simulation? What aspects would you need to consider before presenting the scenario? Would you flip the classes to introduce some content related to the scenario? How would you make sure your students are sufficiently prepared to carry out the action? What criteria would you follow to make the teams?
(b) *action:* What is your role as a facilitator of the simulation? What aspects should you consider when facilitating? What norms would you remind yourself and your students to consider? How would note-taking be conducted? Would you record the students?
(c) *debriefing:* How would you go about the reflection? How would you share your facilitation notes? How would your comments and questions be conducive to reinforce learning?
(d) *simulation creation:* Bearing in mind your students in the practice school, create a simulation adapted to the students' interests, learning outcomes, and English level. Pay special attention to all the simulation phases.

By setting our future teachers this challenge, we provide more flexible and individualized instruction as we offer the opportunity for adequate tutorial guidance and scaffolding material in smaller groups. Thus, the flipped model helps maximize each learner's potential for success, as teachers can move around the classroom, approach individual learners, and identify learning styles, interests, abilities, and difficulties to provide differentiated instruction (Fuller, 2015; Hiemstra & Sisco, 1990; Jonassen & Grabowski, 2012; Mazur et al., 2015).

In addition, another flipped learning pillar is the learning culture. Our future teachers demonstrate commitment in the construction of knowledge. They gain autonomy by doing research on simulation outside of the class, so this instructional shift from a teacher-centered to a learner-centered approach provides more opportunities to deal with a variety of topics in class and create a rich learning environment (Bailey et al., 2013; Bergmann et al., 2013).

The implementation of the flipped classroom model demands a high degree of professionalism, as we must provide relevant and individualized feedback, carry out ongoing formative assessment, and guide future teachers on their reflections and proposals (Bergmann et al., 2013; Bergmann & Sams, 2012; Berret, 2012; Musallam, 2014).

10.3 Materials and Methods

A group of postgraduate students (N = 57) were asked to respond to a classroom-based experience in the official postgraduate course titled 'Didactic Resources for Teaching EFL and Literature in Secondary Schools'. The data were collected from two consecutive courses.

Following the flipped learning model, future teachers used text and video materials uploaded to the virtual campus to prepare for class sessions. Before creating their simulation, future teachers participated in a simulation themselves. (See simulation in Appendix). Then, in teams of up to 5–6 members, future teachers worked together on the design of complete simulations on common topics dealt with in secondary schools: the use of mobile phones in class, homework, a balanced diet, workout addiction, among others. The ultimate goal was to develop scenarios, profiles, procedural norms, and debriefing instructions. Figure 10.1 describes the procedure followed.

First, the future teachers participate in a complete simulation (Masterminders' School) to, in Dewey's words, 'learn by doing' (1938). Experiencing the simulation for themselves, the future teachers start to get the gist of the methodology they will later analyze.

Second, after going through all the phases of the simulation themselves, the future teachers are posed with the challenge: 'create a simulation to be used in secondary school'. As most do not work yet, they are asked to have their placement school in mind to contextualize and adapt the simulation. Their research is two-fold: (a) find information about simulation in EFL, its virtues, its limitations, procedure,

Fig. 10.1 Complete process in simulation creation

tips on facilitation and (b) find possible topics usually studied in the English subject in secondary school. The flipped classroom model is used in which videos and reading materials are consulted from the virtual campus. In class, learning corners are created to go about the four core aspects of research: briefing–action–debriefing–simulation creation.

Third, clear guidelines are provided on how to design a simulation. Future teachers work collaboratively on the simulation creation in same groups as for the 'Masterminders School' simulation.

Finally, the future teachers' simulations are shared with the other groups and they receive feedback from their peers.

The future teachers reflect on the teaching proposal for the course by responding to the following question in writing: 'Comment on your experience with simulation as a teaching-learning strategy'. Written responses (N = 57) are uploaded onto the university virtual campus and later extracted for analysis. The study follows a qualitative design that has reached a height, especially in the social sciences, where the role of participants and their perceptions are highlighted by their own discourse (Glaser & Strauss, 1967; Goetz & Le Compte, 1988; Harris, 2005; Martínez, 2000; Rodríguez et al., 1996; Sandín Esteban, 2003; Vallés, 1997, 2002). Responses were first classified into initial categories and subcategories until saturation of the data with the aid of Dedoose Version 9.0.17. Finally, the main conceptual categories are defined and interpreted.

10.4 Results

The future teachers' responses to 'Comment on your experience with simulation as a teaching-learning strategy' yielded three core categories: simulation in teacher education; simulation to enhance communication in English; integration of methodological approaches.

As for the first category, simulation in teacher education, most future teachers indicated the forceful quality of simulation in their degree. The whole subject was built around simulation which eased their understanding of the methodology. As some students reported:

> Simulation should have been used in other subjects in our degree. I could feel the challenges from a very practical perspective, placing myself in my students' shoes. (S3)

> Simulation is a powerful strategy for all teachers. There is real practice about communicating with workmates, dealing with serious issues and finding good solutions. (S12)

Students' comments have contributed to the ratification of two important aspects in teacher education: the importance of experiencing active methodologies in their degrees, some of which they would eventually use with their own students/learners; and the ignored simulation potential in teacher training. Several studies indicate that simulation requires a vast preparation on the part of the facilitator as well as his/her expertise to make the most of the experience (Agllias et al., 2021; Bradshaw et al.,

2018, 2021; Pas et al., 2019). In contrast to traditional simulation instruction, in our study, the method emerged from experimentation of a simulation and later research instead of lecturing about simulation. In spite of all the virtues of simulation identified and extensively discussed in this volume, we may assume these might be some of the reasons why simulation is not widely adopted in teacher education programs.

The creation of simulations based on secondary school content material helped future teachers become more critical about the textbooks and material used in EFL lessons.

> If I were a student in secondary, I would like English. I don't see the point of having a book which is expensive and boring. (S17)

> I should have learned more English had I done simulations in my classes. (S18)

> Now, I feel I can adapt the material students use in the English lessons by creating simulations and communicative exercises. (S34)

In the second category simulation to enhance communication in English, the future teachers found numerous benefits. By using simulation, from simple ones to more demanding in terms of content knowledge and grammatical structures, most of the teachers indicated the need to manage a wider range of language-related skills.

> I understand that simulation requires preparation in relation to content and vocabulary. The use of simulations in secondary school will help students learn more English than in conventional lessons. (S9)

> Through the simulation, students will be able to use the target language with a clear purpose. They will not be restricted to answer common questions as in Cambridge exams. Instead, they will use their knowledge of a topic to create more knowledge using English as a vehicle for communication. (S33)

At this point, it is important to draw a distinction between simulation to enhance communication in English and simulation to foster English learning. Although these may look like synonymic terms, they are not. What the future teachers are observing is the purposeful nature of simulation in communication. It is not about the accurate use of the English language per se. It is about the need to have something to say about a specific topic. Simulation can become a powerful strategy to gain fluency in a foreign language (Angelini, 2021; Angelini & García-Carbonell, 2019; Crookall & Oxford, 1990; García-Carbonell et al., 2001). As the future teachers participated in a simulation themselves, they could elucidate the dialogic nature of simulation interactions.

The third category 'integration of methodological approaches', addresses the flexible nature of simulation. The different phases in the simulation require different methodologies to apply. In our study, we resorted to flipped classroom from a very instrumental perspective. We needed to save class time. So, instead of devoting time to theorize about simulation, we provided the future teachers with recorded and reading material to be prepared before coming to class. In this way, we were able to conduct meaningful discussions leading to the design of their own simulations.

> I really learned by watching the videos though I was skeptical at first. Not knowing what to expect from the course made me feel uneasy. However, it was the first lessons and then things ran smoothly. I like the flipped model. I think I'll use it in the future. (S6)
>
> The classes were far more dynamic than other lessons I have had. I learned from the stations or corners because they had questions that triggered our knowledge about simulation. (S48)

As we can observe, changing methodologies may result 'uneasy' for some. However, it is important for facilitators to keep focused and indicate the learning outcomes expected. Working with simulation is like a journey in which students/participants and facilitators embark. There is a procedure to follow, there are many aspects to consider. A solid, rounded briefing will guarantee success in the simulation placement; a well-prepared facilitator will anticipate inconveniences and will work accordingly; a constructive debriefing will help consolidate the learning and will make the experience repeatable.

10.5 Conclusion

This chapter has attempted to answer the question 'Can the creation of simulation scenarios be an effective way to introduce simulations as a classroom technique?'. We can argue that some of the findings are conducive to highlighting the value of simulation design in teacher training. The very flexible nature of simulation allows the integration of methodological approaches like the ones implemented in the study: flipped classroom and learning stations. The future teachers' responses to the open question 'Comment on your experience with simulation as a teaching-learning strategy' confirmed the merits of the proposal. Simulation in teacher education is considered necessary to immerse future teachers in educational realities at a low risk and can become a fruitful strategy to promote communication over specific topics. Furthermore, by integrating the flipped learning model, learning station and simulation, we propose to plunge students into dynamics in which they are benefitted not only linguistically but also professionally. Although successive qualitative and quantitative studies over time and a broader sample may increase reliability in the integration of flipped classroom, learning station and simulation in foreign language learning, the results of the present study indicate that the approach can be an effective way to introduce simulation in foreign language classes in secondary education.

Appendix

Simulation: 'Masterminders School'

Briefing sheet

Masterminders School provides a learning culture that embraces change and a desire for continual improvement, producing well-rounded individuals with the skills and knowledge for success. Masterminders School encourages the

development of enquiring minds and nurtures a love for learning. It develops perseverance and determination to complete challenging tasks. Children are encouraged to learn from their mistakes and think about the consequences of their actions with regard to their work and their behavior. Children are to be able to work in a variety of situations, developing cooperation, empathy, and team spirit. Children actively work with the latest technology and do projects in teams.

Sadly, very recently, two Masterminders pupils have had serious health problems. One of them, Tim (11 years old) has been suffering terrible headaches which made him skip most of the second-semester classes. He is in 6th-Grade Primary. The other pupil is Tiffany. Tiffany is only 15 and has been diagnosed with an unusual insomnia for a young person as she is. In both cases, their parents put the blame on the great exposure to radiation at school.

Here's an open letter from Tiffany's mother:

There is a last-minute meeting to deal with these two cases as several parents have begun to worry about this situation which may be damaging pupils' health. The governing body is also affected as the school project may be jeopardized.

The Governing Bodies attend the meeting:

1. HEAD OF SCHOOL: Runs the school and is in charge of strategic developments for the school and receives reports from the Head teachers. The HEAD OF SCHOOL strongly support technology and educational innovation and is HEAD PARENT 1's friend.
2. HEAD TEACHER 1: Specialist in charge of 5th Grade and does not like technology very much. She/he needs the job to support the family.
3. HEAD TEACHER 2: Specialist in charge of 6th Grade. Very ambitious. Would like to become the Head of the school in two years-election.
4. HEAD PARENT 1: Representative of the MASTERMINDERS PARENT GROUP and Helen Miles' closest friend (Tiffany's mother).
5. HEAD PARENT 2: Former MASTERMINDERS' pupil. Loves the school.
6. FOMS: Friends of Masterminders School. FOMS' mission is to raise funds to allow the school to have the things that the budget won't (allow) stretch to. But it is not only about money but also wants to create a sense of community and have some fun. FOMS have economic agreements with Apprit, the Company that has sponsored the families with free aPads (tablets). However, they fear their children suffer from similar effects as Tim and Tiffany.

Objectives

1. To ban WiFi from school?
2. To keep or ban school project?
3. To get money in compensation for health problems?

An innovative strategy must be negotiated.

Profiles

Head of School
Head Teacher 1
Head Teacher 2 Head Parent 1
FOMS Member
Head Parent 2.

Time Allotted

Background study: 20 min; Action: 30–40 min

Profile 1—HEAD OF SCHOOL

OBJECTIVE

To convince the rest of the Governing Body to continue with the school projects, which require pupils operating electronic devices. Masterminders School is a leading institution for its innovation program and receives each year several grants from the regional educational department.

An innovative strategy must be negotiated.

BACKGROUND

You are the HEAD OF SCHOOL. You run the school and are in charge of the school's strategic developments. You strongly support the use of technology and educational innovations. Your school gets quite a lot of economic support to carry out the projects, which require the use of electronic devices. You are HEAD PARENT 1's friend.

Profile 2—HEAD TEACHER 1 OBJECTIVE

To ban WiFi and ICT projects.

An innovative strategy must be negotiated.

BACKGROUND

You are the HEAD TEACHER 1, specialist in charge of 5th Grade. You do not like technology very much. In fact, you also suffer from headaches while you are at school and use medication. You are afraid you might be dismissed if you do not support the school's initiative. You want to ban WiFi but you need the job to support the family.

Profile 3—HEAD TEACHER 2 OBJECTIVE

To show you are a decision-maker and a very good candidate for running the institution in 2 years.

BACKGROUND

You are HEAD TEACHER 2, specialist in charge of 6th Grade. You are very ambitious. You do not care much about education. You are in fact rather tired of the monotonous job and would like to become the HEAD OF SCHOOL in 2 years election. You will do whatever necessary to finally get it. You know you need the support of the actual HEAD OF SCHOOL. However, parents have a very strong voting decision.

Profile 4—HEAD PARENT 1 OBJECTIVE

To mediate between the Head of the school's strong position and parents' complaints about the exposure to radiation.

An innovative strategy must be negotiated.

BACKGROUND

You are HEAD PARENT 1: Representative of the MASTERMINDERS PARENT GROUP and Helen Miles' closest friend (Tiffany's mother). As a parent, you want the best type of education for your two children. As Helen's friend, you firmly believe that Tiffany has been seriously affected by the continuous exposure to radiation at school.

(Profile 5—HEAD PARENT 2) Extra OBJECTIVE

To have the best-ranked school in the region.

BACKGROUND

You are HEAD PARENT 2, a former MASTERMINDERS' pupil. You love the school. Your only child is about to graduate next semester.

Profile 6—FOMS Representative OBJECTIVE

To continue receiving funds from Apprit. An innovative strategy must be negotiated.

BACKGROUND

You are a FOM's member. As you know, FOM's mission is to raise funds to allow the school to have the things that the budget won't stretch to! FOMS also wants to create a sense of community and have some fun! It organizes events for the families. FOMS have economic agreements with Apprit, the Company which has given all the families' aPads for free.

However, you know that most FOM's members fear their children suffer in the future from similar effects as Tim and Tiffany.

Facilitation's Notes

- Materials Needed: None
- Simulation Type: Closed, realistic

- Time Allotted: Background study 20 min—Action 30–40 min
- Number of Participants: five to six per group [multiple groups can participate at the same time]

GOAL:

This is a group activity that challenges and tests participants' innovation competences, in order to identify the skills and capacities shown in individual, and interpersonal dimensions.

PROFILE ROLES:

1. HEAD OF SCHOOL: Runs the school and is in charge of strategic developments for the school and receives reports from the Headteachers. The HEAD OF SCHOOL strongly supports technology and educational innovation and is HEAD PARENT 1's friend.
2. HEAD TEACHER 1: Specialist in charge of 5th Grade and does not like technology very much. She/he needs the job to support the family.
3. HEAD TEACHER 2: Specialist in charge of 6th Grade. Very ambitious. Would like to become the HEAD OF SCHOOL in 2 years election.
4. HEAD PARENT 1: Representative of the MASTERMINDERS PARENT GROUP and Helen Miles' closest friend (Tiffany's mother).
5. HEAD PARENT 2: Former MASTERMINDERS' pupil. Loves the school.
6. FOMS: Friends of Masterminders School. FOMS' mission is to raise funds to allow the school to have the things that the budget won't stretch to! But it is not only about money, FOMS also want to create a sense of community and have some fun! FOMS have economic agreements with Apprit, the Company which has given all the families' aPads for free. However, they fear their children suffer from similar effects as Tim and Tiffany.

Facilitating the Simulation:

BACKGROUND

- The simulation will be performed in groups of five to six people, one will be the representative of the five or six profiles involved.
- Participants are provided with the briefing sheet displayed on the smart board and a profile sheet.
- Participants must read and think of persuasive arguments to fulfill their objectives.
- An innovative strategy must be negotiated.

BRIEFING

Begin the exercise by dividing participants into groups of five to six. Allow group members 20 minutes to read over their briefing/profile sheets and become familiar with the situation described. Clarify any questions before beginning the exercise.

Have each group begin by having participants introduce themselves in their role and personal situation. Remind participants about their background and goals.

DURING THE SIMULATION

Each group should spend about 30/40 minutes discussing the rights of each represented sector. Participants will use their own personal strategies to persuade the others by negotiating possible, innovative alternatives. A consensus solution should be achieved.

Note

All members must agree to a decision (i.e. a consensus). If multiple groups perform simultaneously and the situation is recorded in order to assess the participants 'performance later, it is advisable to hold the sessions in separate rooms in order to get clear sound and avoid the different groups' influencing one another.

DEBRIEFING

When all of the groups have arrived at their final decision allow them to discuss:

- The situation itself
- Their performance
- The innovative option agreed upon
- Their feelings and proposals for improvement
- Their perception of learning
- Their perceptions of simulation in EFL classes

Debriefing can be conducted intra-groups first. A wrap-up discussion may take place afterward.

References

Agllias, K., Pallas, P., Blakemore, T., & Johnston, L. (2021). Enhancing child protection practice through experience-based simulation learning: The social work big day in. *Social Work Education, 40*(8), 1024–1037.

Al-Elq, A. H. (2010). Simulation-based medical teaching and learning. *Journal of Family & Community Medicine, 17*, 35–40.

Andreu-Andrés, M. A., & García-Casas, M. (2011). Perceptions of gaming as experiential learning by engineering students. *International Journal of Engineering Education, 27*, 795–804.

Angelini, M. L. (2012). *Simulation and gaming in the development of production skills in English*. Doctoral thesis, Department of Applied Linguistics, Universitat Politècnica de València, Spain.

Angelini, M. L., & García-Carbonell, A. (2014). Análisis cualitativo sobre la simulación telemática como estrategia para el aprendizaje de lenguas [Qualitative analysis about telematic simulation as a learning strategy of foreign languages]. *RIE Revista Iberoamericana de Educación, 64*(2).

Angelini, M. L., García-Carbonell, A., & Martínez-Alzamora, N. (2015). Estudio cuantitativo discreto sobre la simulación telemática en el aprendizaje del inglés [Discrete quantitative study about telematic simulation in learning EFL]. *RIE Revista Iberoamericana De Educación, 69* (2), 51–68.

Angelini, M. L. (2016). Integration of the pedagogical models "simulation" and "flipped classroom" in teacher instruction. *SAGE Open, 6*(1), 2158244016636430.

Angelini, M. L., & García-Carbonell, A. (2019). Developing english speaking skills through simulation-based instruction. *Teaching English with Technology, 19*(2), 3–20.

Angelini, M. L. (2021). *Learning through simulations: Ideas for educational practitioners.* Springer Nature

Asal, V., & Blake, E. L. (2006). Creating simulations for political science education. *Journal of Political Science Education, 2*, 1–18.

Bailey, J., Ellis, S., Schneider, C., & Ark, T. V. (2013). *Blended learning implementation guide*. http://net.edu-cause.edu/ir/library/pdf/CSD6190.pdf

Bergmann, J., Overmyer, J., & Wilie, B. (2013, July 9). *The flipped class: What it is and what is not*. http://www.thedailyriff.com/articles/the-flipped-class-conversation-689.php

Bergmann, J., & Sams, A. (2012). *Flip your classroom. Reach every student in every class every day*. Association for Supervision and Curriculum Development & International Society for Technology in Education.

Berret, D. (2012, February 19). How "flipping" the classroom can improve the traditional lecture. *The Chronicle of Higher Education*, *12*, 1–14.

Bologna Declaration. (1999, June 19). *Joint declaration of the European Ministers of Education*. http://www.ehea.info/

Blum, A., & Scherer, A. (2007). *What creates engagement? An analysis of student participation in ICONS simulations*. APSA Teaching and Learning Conference, Charlotte, NC.

Bradshaw, C. P., Waasdorp, T. E., Pas, E. T., Larson, K. E., & Johnson, S. R. (2018). *Coaching teachers in bullying detection and intervention*. Springer Nature.

Bradshaw, T., Blakemore, A., Wilson, I., Fitzsimmons, M., Crawford, K., & Mairs, H. (2021). A systematic review of the outcomes of using voice hearing simulation in the education of health care professionals and those in training. *Nurse Education Today, 96*, 104626.

Crookall, D., & Oxford, R. L. (1990). *Simulation, gaming, and language learning*. Newbury House.

Dewey, J. (1938). *Experience and education*. Simon & Schuster.

Ekker, K. (2004). User satisfaction and attitudes towards an internet- based simulation. In *Proceedings of the IADIS International Conference Cognition and Exploratory Learning in Digital Age* (pp. 224–232). IADIS Press.

Ekker, K., & Sutherland, J. (2009). Simulation-games as a learning experience: An analysis of learning style. In *Proceedings of the IADIS International Conference Cognition and Exploratory Learning in Digital Age* (pp. 247–259). IADIS Press.

Flanagan, B., Nestel, D., & Joseph, M. (2004). Making patient safety the focus: crisis resource management in the undergraduate curriculum. *Medical Education, 38*(1), 56–66.

Fuller, J. (2015). Investigating a flipped professional learning approach for helping high school teachers effectively integrate technology. In D. Slykhuis & G. Marks (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2015* (pp. 920–924). Association for the Advancement of Computing in Education.

García-Carbonell, A. (1998). *Efectividad de la simulación telemática en el aprendizaje del inglés técnico* [Effectiveness of telematic simulation in learning technical English] (Doctoral thesis). Universitat de València.

García-Carbonell, A., Rising, B., Watts, F., & Montero, B. (2001). Simulation/gaming and the acquisition of communicative competence in another language. *Simulation & Gaming: An International Journal of Theory, Practice and Research, 32*, 481–491.

García-Carbonell, A., & Watts, F. (2012). Investigación empírica del aprendizaje con simulación telemática [Empirical research about learning through telematic simulation]. *Revista Iberoamericana De Educación, 59*, 1–11.

García-Carbonell, A., Watts, F., & Andreu-Andrés, M. A. (2012). Simulación telemática como experiencia de aprendizaje de la lengua inglesa. *Revista De Docencia Universitaria, 10*, 301–323.

Glaser, B. G., & Strauss, A. (1967). *Discovery of grounded theory: Strategies for qualitative research*. Sociology Press.
Goetz, J. P., & Le Compte, M. D. (1988). *Etnografía y diseño cualitativo de investigación educativa* [Ethnography and qualitative design of educational research]. Morata.
Harris, K. M. D. (2005). Teachers' perceptions of modular technology education laboratories. *Journal of Industrial Teacher Education, 42*(4), 52–70.
Hertel, J. P., & Millis, B. J. (2002). *Using simulations to promote learning in higher education: An introduction*. Stylus Publishing.
Hiemstra, R., & Sisco, B. (1990). *Individualizing instruction: Making learning personal, empowering, and successful*. Jossey-Bass.
Jonassen, D. H., & Grabowski, B. L. (2012). *Handbook of individual differences, learning, and instruction*. Routledge.
Martínez, M. (2000). *La Investigación Cualitativo Etnografía en Educación* [Ethnographic educational research in education]. Peter Lang.
Mazur, A. D., Brown, B., & Jacobsen, M. (2015). Learning designs using flipped classroom instruction. *Canadian Journal of Learning & Technology, 41*(2), 1–26.
Musallam, R. (2014, December 10). Should you flip your class-room? http://www.edutopia.org/blog/flipped-classroom-ramsey-musallam#comment-form.
Pas, E. T., Waasdorp, T. E., & Bradshaw, C. P. (2019). Coaching teachers to detect, prevent, and respond to bullying using mixed reality simulation: An efficacy study in middle schools. *International Journal of Bullying Prevention, 1*(1), 58–69.
Rising, B. (1999). *La eficacia didáctica de los juegos de simulación por ordenador en el aprendizaje del inglés como lengua extranjera en alumnos de Derecho, Económicas e Ingeniería* [The effectiveness of telematic simulation games in EFL for Law, Economics, and Engineering] (Doctoral thesis). Universidad Pontificia Comillas.
Rising, B. (2009). Business simulations as a vehicle for language acquisition. In V. Guillén- Nieto, C. Marimón-Llorca, & C. Vargas-Sierra (Eds.), *Intercultural business communication and simulation and gaming methodology* (pp. 317–354). Peter Lang.
Rodríguez, G., Gil, J., & García, E. (1996). *Metodología de la Investigación Cualitativa* [Methodology for qualitative research]. Aljibe.
Sandín Esteban, M. P. (2003). *Investigación cualitativa en Educación* [Qualitative research in education]. McGraw-Hill.
Strayer, J. F. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system* (Doctoral dissertation). The Ohio State University.
Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*, 171–193.
Sutherland, J. (2000, July 7). *Making good things even better: An IDEELiStic approach to telematics simulation*. Presentation prepared for ED-MEDIA 2000, Montreal, Québec, Canada. http://www.ideels.uni-bremen.de/.
Sutherland, J. (2002). *Value-added multilateral curriculum development: Project IDEELS*. http://www.ideels.uni-bremen.de/
Tourón, J., Santiago, R., & Diez, A. (2014). *The flipped classroom: Cómo convertir la escuela en un espacio de aprendizaje* [The flipped classroom: how to turn school into a learning environment]. Grupo Océano.
Tucker, B. (2012). The flipped classroom. *Education Next*, *12*(1), 82–83.
Vallés, M. (1997). Técnicas cualitativas de investigación social. Reflexión metodológica y práctica profesional [Qualitative techniques of social research. Methodological reflection and professional practice]. Síntesis S.A.
Vallés, M. (2002). *Entrevistas Cualitativas* [Qualitative interviews] (Cuadernos Metodológicos, 32). Centro de Investigaciones Sociológicas.
Watts, F., García-Carbonell, A., & Rising, B. (2011). Student perceptions of collaborative work in telematic simulation. *Journal of Simulation/gaming for Learning and Development, 1*, 1–12.

Wedig, T. (2010). Getting the most from classroom simulations: Strategies for maximizing learning outcomes. *Political Science & Politics, 43*, 547–555.

Woodhouse, T. J. (2011, March 24–26). *Thai university students' perceptions of simulation for language education*. Paper presented at ThaiSim 2011, Ayutthaya, Thailand.

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11 Combining Literature and Simulation to Achieve Curriculum Objectives in Secondary Education and Higher-Level Language Learning

Sandra Garibotto and Hannah Riley

Overview

The importance of implementing literature in its many forms in the English as a foreign language (EFL) classroom is well-known and has been discussed at length, although its shortcomings in particular areas have been noted. In the same way, it has been recognized that using simulation is beneficial in language learning as it gives students the opportunity to use learnt concepts in real life, low-risk situations, and contexts. This chapter will delve into the advantages of employing simulation through the presentation of EFL literature with literary examples. This proposed combined approach will then address some of the traditional problems that arise when using target language literature and allow students in secondary education (and higher) to achieve national curriculum objectives and thrive in their English language studies. Focusing mainly on the Common European Framework of Reference (CEFR; with an emphasis on levels B1-C1) and touching upon the new Spanish curriculum (LOMLOE), the skills that this combined approach offers will be analyzed, not only in academic terms but also transversal skills that both the CEFR and the LOMLOE work to establish. Such skills include critical thinking, interpersonal and communication

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skills, and self-sufficiency, together with the four skill areas of language acquisition, which combine to set the average secondary student on the path to lifelong learning—a worthy goal for any education professional.

Keywords

Literature · Simulation · Virtual exchange · Common European framework of reference · Curriculum design · Language education

Learning Objectives

By the end of the chapter, the reader should be able to:

- Explore the ways in which literature can be integrated into secondary ESL classes through simulation.
- Assess the advantages of using the proposed combination of simulation and literature to improve language skills in more meaningful contexts.
- Understand how these skills involved in simulation and literature are relevant to language learning and can be assessed at a European and national level.
- Foster techniques that allow students of secondary education to develop various transferable skills such as: metacognitive strategies, confidence, decision-making and problem-solving through language learning, ultimately leading to the development of critical thinking and student autonomy.

11.1 Introduction

It is widely accepted that using target language literature is beneficial to language learning in terms of developing the four language skills (Belcher & Hirvela, 2000), and other important interdisciplinary skills, such as critical thinking, problem-solving, communication, collaboration, teambuilding, creativity, and innovation. It also promotes the use of higher order thinking skills, (Carter & McRae, 1996; Ghosn, 2002; Kramsch & Nolden, 1994; Van, 2009). In addition to this, literature deals with topics that are interesting in nature, which encourages motivation (Maley, 1989; Marioara, 2015), cultural awareness, and emotional intelligence (Ghosn, 2002; Lazar, 1990; Van, 2009) especially in the era of globalization (Khatib et al., 2011).

However, even though literature offers many benefits, pedagogically there are still considerable drawbacks expressed by teachers. Many EFL teachers and students view literature as problematic because some literary language is regarded as incomprehensible. In addition, literary vocabulary and grammatical structures are frequently viewed as too complicated (Lazar, 1994). Another hurdle is the length of the text. For some, longer texts may seem more abstruse, while on the contrary, shorter texts can be more difficult due to lack of context and repetition (Duff &

Maley, 1990). Cultural contexts can also cause issues. According to Duff and Maley (1990), it is beyond the bounds of possibility that an outsider—the learner—can fully share the references of an insider—the native writer. Literary texts can also be problematic if they are perceived as conveying an undesirable burden of cultural connotations (Collie & Slater, 1994).

So, why choose simulation to provide the solutions? Firstly, simulation can be used to support "lecture-related materials" and focus on the transfer from conceptual-based knowledge to its ultimate application (Knoesel, 2017). Given its interactive element, learners can work together to make sense of the unknown words they find in literature, allowing them to be presented and applied in relevant contexts. Secondly, Simulation makes learning student-centered and allows students a certain autonomy over how they tackle the text (Levine, 2004).

Thirdly, the benefits of Simulation complement and reinforce those of literature discussed previously. There is sufficient evidence to support Simulation as a form of cooperative learning and to enhance language skills in the EFL learning environment (Scottile & Brozik, 2004). Through simulation, other transversal skills such as critical thinking, self-motivation, organization, teamwork, and higher order thinking skills are activated (Park et al., 2016).

Therefore, it stands to reason that this combined approach would create complimentary conditions in which to teach English as a foreign language through literature. To support this conclusion, the established criteria for language learning set out in the CEFR (The Council of Europe, 2020) and LOMLOE (2020) must also be explored.

11.2 Common European Framework of Reference (CEFR)

The CEFR aims to provide students with the tools to help them become "social agents", and to use English as a "vehicular language" (The Council of Europe, 2020), centering on real-life communicative needs and abilities. Through Simulation and Virtual Exchange (VE), literature can be made more accessible to students due to the increased motivation, relevancy, and student autonomy over the learning process that it brings. In turn, Simulation is given a literary platform in the target language from which to spark ideas and discussion necessary for development in various areas of cognition. Activities that encompass both literature and Simulation are included in the following explanation, so as to provide practical examples of the potential this combination holds in secondary classrooms. Although it would be impossible to measure all the skills defined by the CEFR mentioned in this chapter in one activity, it is important to recognize their place in this combined approach, and their potential for development or evaluation, based on the needs of the participants.

The text chosen to accompany these examples was Roald Dahl's "Lamb to the Slaughter", as it includes linguistic and thematic content relevant to the target age group. Syntactically, most phrases are not too long, avoiding the sense of

convoluting the overall meaning. Longer phrases use common connectors to link ideas, often demonstrating examples of temporal connectors, making them easier to follow. Furthermore, while generally, the lexis is not difficult to understand, there are instances of higher-level lexical choices particularly in the descriptive language used (e.g., "tinkled", "oily swirls") and more antiquated phrasing (e.g., "I'll fix [dinner] anyway", "there needn't really be any fuss", and the concept of "supper") (citations taken from Dahl, 1953). This allows secondary students the opportunity to grasp new concepts and expand their vocabulary while at the same time not overwhelming them with unfamiliar or unnecessarily complex language and is in keeping with the B2 descriptors for overall reading comprehension (The Council of Europe, 2020).

Thematically, while on the surface it can be described as a thriller, with plot twists and the question of whether the protagonist will be apprehended for her crimes, it also opens the platform up for a debate on feminism. Teachers that have used this text before in their Literature classes observed that their students expressed compassion and empathy for the character of Mary (Scharnhorst, 2021), the pregnant wife who murders her husband with a leg of lamb after he tells her he is going to divorce her, and feeds it to the unsuspecting detectives tasked with solving the crime. This may be due to the powerful feminist undertones of her character and her actions (Scharnhorst, 2021; Tanusy, 2018), which highlight the topic for engagement and discussion.

By presenting this text to secondary students through Simulation/VE, EFL students are able to not only comfortably engage with an authentic L2 text but also to debate in the target language on a topical issue. Students are encouraged to undertake their own research and develop and debate ideas in the target language. This, in turn, facilitates the development of language skills and interaction skills outlined in the CEFR.

Assuming that students are already familiar with the text (through in-class reading, flipped classroom learning[1] or otherwise), it is important to begin by outlining the task and expectations. In Simulation and Virtual Exchange, it is usual to introduce the Simulation by explaining to students how these types of activities work and to explain the scenario, known as the briefing stage. During the briefing, students are presented with a written scenario containing the overall and more specific objectives, and the profile descriptions. It is important that students are given ample time to get to grips with this information on an individual scale. The example scenario in this instance contains four job descriptions at Mary's court hearing: the judge, the police officer, the defense barrister, and the prosecution barrister; and the general objective would be as follows:

[1] Flipped Classroom is a form of learning in which new material is given to students to engage with at home, while in-class time is optimized by addressing issues or questions that students may have after reviewing such materials.

> With only the anonymous and censored account already presented as evidence, those tasked with overseeing the historical trial of Mary Maloney must come to an agreement as to whether she is guilty of the murder of her husband, Patrick Maloney, on the afternoon of Thursday 9th April 1953.

For the purposes of the example scenario, the lines 101–117 are omitted from the original text, so that students are unaware of the guilt of the accused. The more specified objectives to be dealt with in the courtroom would be as follows: the lack of a murder weapon, the relationship between Patrick and Mary Maloney, and Ms. Maloney's alibi corroborated by Sam the grocer. Also, during the briefing stage, as well as undertaking a closer reading of relevant parts of the text, students would be encouraged to read around the time period and the key issues presented in the text and objectives (e.g., feminism in the 1950s) so as to further be able to prove the points they want to make later.

Through engaging with the main text, the written Simulation scenario and profile descriptions, and the texts that students come across from their own research, it is possible to identify a range of opportunities for students to meet and develop CEFR objectives at such an early stage. Apart from the "Overall Reading Comprehension" skills, defined at B1-2 levels defined at B1-2 levels as being able to read with reasonable comprehension, independently and with the selective use of appropriate referencing sources (The Council of Europe, 2020), students are also able to delve deeper into the descriptors of more specific reading skills. For instance, students will have to skim and scan texts for gist and to select key information relevant to their job description. These are skills that are present in the B1 descriptors and slightly more developed in the B2 criteria.

Once useful sources have been identified, students must undertake a more detailed reading, covered by the "Reading for information and argument" descriptors, in order to "identify main conclusions in clearly signaled argumentative texts" at level B1, understand articles with particular stances about contemporary problems at B2 level, and even, available resources permitting, selecting information from outside of their field of understanding with the help of a dictionary at level B2+ (The Council of Europe, 2020). Considering the Simulation objectives, this reading occurs in a more meaningful context for the students and allows them more autonomy over how to tackle a task.

Once assigned their groups, students must use the target language as a vehicle to achieve their overall objective. This can be done in a variety of ways, covering many CEFR objectives by using literature as a springboard for interaction in Simulation. In the example situation, students are instructed to have three general whole-group meetings in which they introduce themselves and their personal objectives. They discuss and argue points of view with supporting evidence, request evidence from those who have not provided sufficient back-up in their claims and try to reach a fair conclusion to the case based on the information and arguments presented by all parties. Students are then free to use the remaining time as they wish. This could include organizing additional whole-group meetings, smaller meetings between select members of the group, or extra time to read and work together/individually to gather evidence. It should be noted that depending on the

time available during the classes, these extra activities can be carried out during class or as a form of flipped learning. It is also recommended that students keep minutes of meetings in order to not only work on language skills but also to be able to monitor their activity, and for them to keep a record of what has been discussed and agreed upon. This activity also adds to reflection skills and makes effective use of the feedback from Simulation, an important part of meta-cognition and Experiential Learning (Kolb & Kolb, 2009).

During this stage of the Simulation/VE, students can apply what they have learnt while developing their reading comprehension skills as the basis to exercise their oral production and interaction skills. Referring to the CEFR descriptors outlining overall oral production skills, there is a focus on clear and developed presentation at B2 and C1 levels, with the higher levels requiring the ability to integrate subthemes and come to an appropriate conclusion (The Council of Europe, 2020).

While these levels may appear more advanced, when broken down into the specific production objectives, they begin to appear more attainable when approached through a method such as this. This task allows students to develop their oral skills in two major contexts, as a whole group and in their subgroup(s), which naturally call for various skills considering the different purposes of each situation. Students offer opinions, arguments, and/or presentations for a sustained amount of time, supporting them with the research that they have undertaken in the briefing stage and considering their audience's perspective to effectively persuade them. The skills developed here are covered by CEFR descriptors "Sustained monologue: putting in a case (e.g., in a debate)" and "Addressing audiences" at B1–C1 levels, and center solely on the oral production levels of the student (The Council of Europe, 2020).

However, as Simulation and Virtual Exchange fall under the umbrella of cooperative methodologies, students' interaction skills should also be noted. In the "Overall Oral Interaction" descriptors for level B2, students are once more expected to be able to present and describe clearly, providing relevant additional information, but here they must also be able to interact with "with a degree of fluency and spontaneity", which allows for sustained and relatively fluid conversation, outlining and defending personal views (The Council of Europe, 2020). While it is likely that the achievement of these objectives will be displayed in the larger, more general group meetings where students must ultimately present and defend their case amongst themselves, the smaller subgroup meetings must not be overlooked as an opportunity to observe students' interaction skills for a different purpose.

For instance, consider the CEFR scale for "Information exchange". Here, success at B2 level is defined by the students' ability to reliably relay information, exchange complex information related to their occupational role, and discuss information or area of specialization with other specialists (The Council of Europe, 2020)—all skills relevant to the compilation of evidence and team organization that can be undertaken in the smaller subgroups previously suggested. Whereas descriptors outlining the success criteria for other interaction scales such as "Formal discussions" and "Goal-orientated cooperation", in which students are encouraged to follow and actively contribute to a more professional discussion and environment

at B1 and B2 levels (The Council of Europe, 2020), could be applied to both types of group meetings, independent of the purpose. Furthermore, if these meetings take place online, online interaction scales such as "Online conversation and discussion" and "Goal-Oriented online transactions and collaboration" and descriptors (The Council of Europe, 2020) can also be measured and observed.

Although it may be more difficult to monitor these subgroup meetings and the skills being displayed and developed therein, this can become another opportunity to foster language skills through note-taking. The idea that students can be encouraged to take minutes of meetings not only gives them an experience of a more professional environment that may be useful to them in the future but it also helps to develop note-taking skills, found in the "Mediation Activities" section of the CEFR.

This section focuses on "the ability to grasp key information and write coherent notes" (The Council of Europe, 2020). The opportunity to be able to compile notes from the range of sources that stem from the combined use of Simulation/VE and Literature (e.g., literary texts, contemporary texts and spoken ideas offered by classmates) offers a more holistic experience than either of these methodologies alone.

Moreover, other mediation objectives can also be included at this stage. The CEFR states that mediation scales are there to transform students into social agents, able to construct or convey meaning, sometimes across modalities and languages, within a range of formal and informal contexts (The Council of Europe, 2020). Therefore, skills outlined in the "Collaborating in and Group" and "Leading group work" are also brought to the fore. The B2 success criteria outlining the importance of facilitating peer interaction and group construction of meaning by identifying issues, and contributing to group discussions, decision-making, argument summaries, and creation of organizational processes (The Council of Europe, 2020), are all skills that students will need to employ in both the whole-group meetings and the subgroup meetings in order to effectively comply with the main objectives. Furthermore, using the literature as a springboard, specific profiles can be assigned to students who the instructor has identified will thrive in positions of leadership (e.g. the judge), fulfilling the objectives of the "Leading group work" section that focuses on providing support and guidance, and managing and monitoring the individual and collaborative work of the rest of the group at B2 level (The Council of Europe, 2020).

Centering on Virtual Exchange, some of the CEFR's sociolinguistic objectives that discuss meditating communication, such as "Facilitating pluricultural space" and "facilitating communication in delicate situations and disagreements" (The Council of Europe, 2020) can also be applied. The intercultural space facilitated by Virtual Exchange allows the students to potentially extend their project to include the collaboration with peers from partner schools located in different areas. Here, students must remember that the customs and experiences of their international peers relating to specific topics or processes (such as the judiciary system, as exemplified in this hypothetical scenario) may not be the same as their own. Considering the cultural implications that many literary texts have, this sensitivity

towards intercultural difference must be amplified. When using Virtual Exchange to present literature in secondary education, it is likely that the students will not belong to the same culture as the chosen texts, both in terms of location and sometimes in terms of generation. Therefore, students must work together to navigate the work with consideration for both its contemporary culture and how this reflects on their own beliefs and those of their peers. Of course, this is not something that can always be carried out due to the differing constraints of each school's facilities, but it is something that can greatly benefit students, given the appropriate time and resources.

The final stage is the debriefing. Here, students have already decided their course of action. They deconstruct the process that has led them to their decision, and they share their thoughts and opinions towards the text. It is hoped that, after adopting a more active role while exploring the text and its contemporary background, students will have more knowledge and tools to draw upon when analyzing the text and expressing their personal response—both actions of which are included in the CEFR under the "Mediating Texts" section.

This stage focuses on critical and personal reactions to creative texts, where intermediate levels are expected to give their own interpretation of the development of plot, themes, or characters, how readers are encouraged to identify with them and "give a reasoned opinion of a work, showing awareness of the thematic, structural and formal features and referring to the opinions and arguments of others" (The Council of Europe, 2020). The collaborative aspect and the student-centered approach to tackling the text, afforded by the use of Simulation or Virtual Exchange, will allow students to delve deeper into their reasoning behind their opinions, facilitating sound justification for statements made about the text and with the opinions and arguments shared by their peers during the Simulation to support their claims.

Therefore, as extension activities, students can use this insight to be able to develop their writing skills, either in the form of an essay about the story and its elements or a report about the case proceedings. The CEFR states that, at intermediate levels, these writings must develop a systematic argument, outlining key points and providing appropriate evidence to support any claims (The Council of Europe, 2020). Having explored the text through Simulation/VE in the target language first, students will already be equipped with not only the information, but control of the language needed to articulate these points. Furthermore, though not directly linked with the activity, this approach can encourage students to read for pleasure in the target language more independently, with the knowledge of where to find appropriate reference sources and how to use them selectively—all skills relevant to level B2 outlined in the section "Reading as a leisure activity" (The Council of Europe, 2020).

11.3 The Spanish Educational Curriculum (LOMLOE)

Considering the linguistic advantages of this combined approach at a European level, let us now analyze how it complies with those language-learning objectives that emanate from the law at a national level.

Analyzing the LOMLOE, it is an undeniable fact that there exists integrative didactics to language learning which is originated and reflected mainly in four major international bodies, the United Nations Educational, Scientific and Cultural Organization (UNESCO)[2]; the Council of Europe[3]; the CEFR; and the 2030 Agenda for Sustainable Development.[4]

UNESCO states that the main learning objectives are learn to learn, learn to do, learn to be autonomous, learn to live together and long-life learning.

The Council of Europe has adopted a Recommendation on Key Competences for Lifelong Learning based on a commission proposal. The Recommendation identifies eight key competences needed for personal fulfillment, a healthy and sustainable lifestyle, employability, active citizenship, and social inclusion. These eight Key Competences are:

- Literacy.
- Multilingualism.
- Numerical, scientific, and engineering skills.
- Digital and technology-based competences.
- Interpersonal skills, and the ability to adopt new competences.
- Active citizenship.
- Entrepreneurship.
- Cultural awareness and expression.

As previously discussed, the CEFR claims that the main objective is to promote language learning among the different European cultures. Foreign languages are assets of vital importance nowadays. Our world is characterized by increased global interdependencies, the proliferation of travel as a leisure activity, borderless working capacities, and the necessity for collaboration in the development of complex ideas. Hence, a significant need has developed for language knowledge as it has become a highly complementary skill set for people both in their personal and professional lives. The language that has been particularly dominant for communicative purposes is, undoubtedly, English.

The 2030 Agenda for Sustainable Development states 17 global goals to be attained by 2030. One of these 17 goals is quality education, and its principal objective is to work together towards a more egalitarian society in which no one is left behind.

[2] The United Nations Educational, Scientific and Cultural Organisation was founded in 1945.
[3] An international organization of European countries who strive to facilitate communication and unity among its members, founded in 1993.
[4] Outcome of the United Nations General Assembly 2015 agenda.

These are the pillars upon which the Spanish Education system is built and what is more, the new Spanish Educational law (ley Celaá) has used as the framework to modernize the previous laws and to comply with one of the most important challenges of the twenty-first century that is to provide every learner with the essential, indispensable tools to become integral human beings and citizens of this new era that we are now facing.

Consequently, this educational need to find different teaching-learning techniques to suffice the objectives set out in the law is answered by the approach offered.

The main elements from the curriculum in consonance with a Literature-Simulation combined approach, after analyzing the Introduction to the Course Curriculum of the First Foreign Language, are the following:

- Holistic communicative approach.
- Integrative didactics to language learning.
- The four blocks (in alignment with the four language skills).
- The fifth block (transversal competences/soft skills).
- Metacognitive strategies to develop the capacity to learn how to learn (planning, monitoring, evaluating).
- Autonomous and life-long learning.
- Moral values.
- Student-centered approach.
- The teacher as a facilitator.
- Dialogic learning to ensure interaction among students.
- Equity.
- The dexterity of higher-order thinking skills by Bloom's taxonomy.
- Active and autonomous roles of the students are reinforced.
- Grammar is not an objective, but a tool for communication.
- Mistakes are not penalized, unless they hinder understanding.

Many of these elements can be found in the proposed Simulation scenario above, in which students are encouraged to actively become a part of the story, and to form their own ideas, opinions, and conclusions based on their interpretations of the text and knowledge gained from their own research in the target language. The student-centered approach, the metacognitive strategies (planning, monitoring, and evaluating) and the dialogic nature of the learning that takes place during Simulation, is afforded substance by the inclusion of the literature, in this case "Lamb to the Slaughter", which gives students meaningful content (contemporary themes, culture, and plot). By applying what they have understood from the text and their investigation in the briefing stage and using it to analyze in order to inform their decision-making (necessitated by the nature of the Simulation scenario), students are able to complete the main part of the Simulation and reach a conclusion. Then, in the debriefing stage, students can use this process of textual interaction to access the higher order thinking skills as mentioned in Bloom's Taxonomy (Bloom, 1956) to evaluate their own performance and those of their peers, and to create their own

writings (the report, essay, or piece of creative writing previously mentioned) or other pieces of work which allow them to demonstrate the culmination of their efforts during the aforementioned activities, fostering critical thinking skills needed to promote lifelong learning and academic autonomy as it is stated in the law (LOMLOE).

Furthermore, the learning environment created by simulation and virtual exchange and fuelled by literature encourages students to focus on communication rather than grammar and lexical mistakes, therefore lowering their affective filter (Krashen, 1988). The responsibility is placed on students to control and modify their own use of language to be able to communicate effectively. This is particularly important when referring back to instances of Virtual Exchange in which students may have the opportunity to interact with peers in an international setting. It affords students the tools with which to communicate to a wider range of people about cultural topics (without fear of mistakes) and develops responsibility for their own learning. Also, including the need for real communication through the meaningful context provided by the literary work and the reduction in this fear of mistakes increases motivation among participants.

Finally, again in keeping with the stipulations in the LOMLOE, this combined approach of presenting literature through Simulation helps to promote the value of morals and respect, both in terms of the content of the literature itself, and the way in which the discussions are managed around it. As with "Lamb to the Slaughter", morals presented in Literature can be discussed and criticized as part of the Simulation scenario, again encouraging students to access higher-level thinking skills and developing their moral compass—all in the target language. This serves the ultimate objective of the LOMLOE, which is to create integral citizens and human beings. Furthermore, by the act of debating and interacting itself, students are put in a situation in which they must act respectfully towards their peers to achieve the tasks set out—regardless of their background. This includes active listening and effective team communication. Through this inclusion of respect and morals, equity in education is promoted by the students themselves, another key objective of the Spanish Educational System.

Therefore, the theoretical underpinnings for LOMLOE (the eight key competences, the 2030 Agenda for the Sustainable Development, CEFR, UNESCO's learning objectives, and the ideas of some of the great educational psychologists) are the main elements that are in perfect harmony with the proposed approach.

11.4 Conclusion

This combined approach can help twenty-first-century secondary students to practice language and bring literature to life in real-life contexts—making it more relevant to them and increasing their motivation to adopt it into their language-learning strategy arsenal. The promotion of effective communication and

real-life learning seen at a national and international level of language learning are its ultimate objectives.

Although it would be challenging to measure all the skills that students can develop mentioned above in a single session, instructors can carefully select those that they do want to evaluate in specific moments, and the others will continue to be developed throughout the different activities.

This shows the flexibility of the technique and the value it holds as both an assessment tool and away to foster creative language practice.

This combined approach can also open new channels of investigation. For instance, it would be interesting to conduct more research on how this combined approach can help attain goal number 4 from the Agenda 2030 that aims: "to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" and cater to students with special needs. Also, in the era of global digitalization, it would be interesting to know how we can integrate Virtual Reality to represent literature in Virtual Exchange Simulation to bring gamification to life in the classroom.

11.5 Summary

This chapter aims to show how simulation through literature can be combined in such a way to render our classes a 180-degree turn, help our learners become the center of their own learning process, provide them with meaningful, motivating contexts, and therefore cater to all the essential, indispensable tools needed to become autonomous twenty-first-century students. In addition, this combined approach fulfills the many requirements as stipulated by some of the leading authorities in language learning (both at a global and national level). Other non-language skills, such as motivation and metacognitive strategies, as well as other soft skills, are enhanced and optimized by the use of this combined approach, portrayed through the Simulation of "Lamb to the Slaughter" by Roald Dahl (1953).

References

Belcher, D., & Hirvela, A. (2000). Literature and L2 composition: Revisiting the debate. *Journal of Second Language Writing*.

Bloom, B. (1956). *Taxonomy of educational objectives*. Longman.

Carter, R., & McRae, J. (1996). *Language, literature and the learner*. Pearsons.

Collie, J., & Slater, S. (1994). *Literature in the language classroom*. Cambridge University Press.

Dahl, R. (1953). *Lamb to the slaughter*. Harpers.

Duff, A., & Maley, A. (1990). *Literature*. Oxford University Press.

Ghosn, I. K. (2002). Four good reasons to use literature in primary school ELT. *ELTJournal, 56* (2), 172–179.

Khatib, M., Derakhshan, A., & Rezaei, S. (2011). Why & why not literature: A task-based approach to teaching literature. *International Journal of English Linguistics, 1*(1), 213.

Knoesel, J. (2017). *Effect of implementation of simulation on critical thinking skills in undergraduate baccalaureate nursing students*. City University of New York.
Kolb, A., & Kolb, D. (2009). The learning way: meta-cognitive aspects of experiential learning. *Simulation Gaming, 40*(3), 297–327.
Kramsch, C., & Nolden, T. (1994). Redefining literacy in a foreign language. *Die Unterrichtspraxis/Teaching German* (pp. 28–35).
Krashen, S. D. (1988). *Second language acquisition and second language learning*. Prentice-Hall International.
Lazar, G. (1990). Using novels in the language-learning classroom. *ELT Journal, 44*(3), 204–214.
Lazar, G. (1994). Using literature at lower levels. *ELT Journal, 48*(2), 115–124.
Levine, G. S. (2004). Global simulation: A student-centered, task-based format for intermediate foreign language courses. *Foreign Language Annals, 37*(1), 26–36.
LOMLOE. (2020). Retrieved July 14, 2021, from https://www.boe.es/eli/es/lo/2020/12/29/3.
Maley, A. (1989). Down from the pedestal: Literature as resource. In *Literature and the learner: Methodological approaches* (pp. 10–23).
Marioara, L. (2015). The education change for in need student-centred learning. *Procedia -Social and Behavioral Sciences, 191*, 2342–2345.
Park, M., Conway, J., & Macmillan, M. (2016). Enhancing critical thinking through simulation. *Journal of Problem-Based Learning, 3*, 31–40.
Scharnhorst, R. (2021). Teaching with paratext. *The CEA Forum, 49*(1), 3–28.
Sottile Jr, J. M., & Brozik, D. (2004). The use of simulations in a teacher education program: The impact on student development. A critical review. *Online Submission*.
Tanusy, J. (2018). Feminism in Roald Dahl's "Lamb to the Slaughter": A semiotic analysis. In: *Proceedings of the Fourth Prasasti International Seminar on Linguistics* (Prasasti 2018) (pp. 159–163). Atlantis Press.
The Council of Europe. (2020). *Common European framework of reference for languages: Learning, teaching, assessment—Companion volume*. Council of Europe Publishing.
Van, T. T. M. (2009). The relevance of literary analysis to teaching literature in the EFL classroom., *English Teaching Forum, 47*(3)2.

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‘Literature Always Anticipates Life’: Selecting Target Language Literary Texts for Simulation

12

Hannah Riley

Overview

True to the words of Oscar Wilde, one of the defining features of literature is the crucial role its contemporary backdrop has had in influencing its creation—from the dystopian fiction of the early 20th Centry that framed the social and political unrest, to the technology age and the subsequent boom in science fiction. While it is true that not all fiction is created equal (or, some would say, some more equal than others), when assessing the needs of English as a Foreign Language (EFL) students in secondary education, it is important to consider this cultural context, among other factors, that may help or hinder a student’s learning. With this in mind, when working with simulation scenarios centred on literary texts, it is vital that teachers are aware of how to choose said texts based on the strengths of said methodology as well as their own educational objectives. Centring on textual features such as cultural appropriacy, length, linguistic difficulty, and thematic content, this chapter will discuss not only *what* can be considered useful literature to work with alongside simulation, but also *how* these texts can be brought into play in order to help students of secondary education get the most out of their EFL classes. Used correctly, literature presented through simulation has the ability to unlock endless possibilities for students, both academically and beyond.

Keywords

Literature · Simulation · English as a foreign language/English as a second language · Literary texts

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Learning Objectives

By the end of this chapter, the reader should be able to:

- Recognise the important factors that are involved when selecting target language literature to be presented through Simulation and Virtual Exchange.
- Identify key features of a literary work that would make it an ideal text to be used in simulation and Virtual Exchange and explain why these features are desirable.
- Explain how texts with desirable features can be used in order to help students of secondary education with their English Language studies.

12.1 How Can Literature Complement Simulation Scenarios in EFL Classes?

In order to be able to effectively select appropriate literary texts that allow our students to unlock their maximum potential when using simulation, it is important to discuss what literature actually is. The present-day definition of literature is far more inclusive than that of the past century, as nowadays other textual mediums such as advertisements, newspaper reports, magazines, song lyrics, blogs, internet, and other multimodal texts can also be included under this umbrella term (Carter, 2007; The Council of Europe, 2020). This, therefore, broadens the range of what literary works we as teachers can use to inspire and motivate students studying English as a Foreign Language (EFL) in secondary education.

With such a wide choice, however, comes the problem of *how* to choose. When it comes to selecting literary texts for EFL learners, it is generally accepted that practical factors such as linguistic difficulty, length, cultural difficulty and cultural appropriacy often present problems (Lazar, 1990; Bobkina & Romero, 2014; The British Council, N.d.). These difficulties greatly reflect the aspects of Simulation and Virtual Exchange that help it to be a useful tool in language learning as explained below by Devos et al.:

> Teaching a foreign language through simulations allows students to experiment with new vocabulary and structures, combines language learning and the development of professional competencies, promotes identification with the target culture and reduces the language interference, (2021).

Also, while much research has been conducted on how to tackle these issues in a more general classroom context, not much has been discussed about how to identify texts appropriate for and relevant to such skills and challenges that simulation brings.

Therefore, this chapter aims to delve deeper into the impact that these practical factors have when literature is designed to be presented through Simulation and Virtual Exchange, as it is clear that using both together highly benefits students. For example, when using an important plot event, an emotional conflict in a character, or even a decision on when/how to use said piece of literature and employing it as

the basis for a simulation scenario, based on 'real-world systems or phenomena' (Lunce, 2006, p. 37). Considering the factors mentioned above, a practical guide is proposed for choosing texts for projects involving using literature alongside Simulation and Virtual Exchange, discussing *what* texts can be considered useful to use alongside simulation, and *how* they can be used, in order to help students of secondary education benefit the most from their EFL classes.

12.2 A Question of Culture: Literature with a Big or Small 'L'?

McRae (1994) talks about two kinds of literature, one with a large 'L', and one with a small 'l'. Literature with a large 'L' is thought to be the 'best' works, a term exclusive only to those that are included in the literary canon, whereas literature with a small 'l' is more inclusive regarding subject matter, origin, and style (Maley, 2001). When considering the choice between these two types of literature, many educational professionals can agree on two things.

First, literature can be a cultural minefield which can bog students down. This may not only affect them at an academic level but also at a motivational one (Lazar, 1990). Second, the topic or themes must pique the students' interest and grab their attention (The British Council, N.d.).

This section will address problem number one. The second will be dealt with later in the chapter.

One of the most anticipated problems when working with canonical Literature in EFL studies is the oftentimes heavy cultural and historical references that are entwined within each work (Marley, 2001). However, there are benefits of exposing students to such information, such as developing the ability to understand and appreciate other cultures, as well as being able to analyse the literature from a contemporary perspective (Carter & Long 1991, cited in Maley, 2001, p. 182). Therefore, as educational professionals, it is up to us to find this balance in the literature that we choose to present to our students.

When presented through Simulation/Virtual Exchange, it can be argued that a wider and more in-depth range of unfamiliar cultural content in literature can be explored. This is largely thanks to the cooperative nature of Simulation and Virtual Exchange, which affords learners a number of cultural benefits. Firstly, the student interaction it demands promotes the incorporation and retention of new information, due to the fact that it gives students the opportunity to actively process information through interacting with their peers (Ravenscroft et al., 1999). The explanation for this can be found in the term coined by Vygotsky as the 'Zone of Proximal Development',[1] which refers to what a student can achieve working independently compared to what they can achieve working in a group with members of a higher

[1] A term to describe the difference between what a learner can achieve on their own, and what they can achieve with help from someone with more knowledge.

level than their own (Vygotsky, 1978). This is what helps learners work cooperatively: operating within each other's zones of proximal development means that they can achieve more advanced knowledge and behaviours than if they were to work individually (Slavin, 2014).

Furthermore, this dialogue presents a greater chance for cultures to mix between the students themselves, an observation which is particularly relevant to Virtual Exchange where students are more likely to come from different backgrounds. 'The Principle of Multiplicity' states that no two learners will see the world in the same way, and the interaction of these different points of view when learning and trying to understand concepts make learners more tolerant of other cultures and ambiguity (Ryan, 1997, cited in Ravenscroft et al., 1999, p. 165). Thus, students are given another advantage when it comes to addressing culture.

In this way, it can be said that, by working together to investigate the texts, secondary students using simulation to work with literature can be exposed not only to canonical literature which requires slightly more advanced cultural understanding but also other more modern texts that require more cultural information to be better understood. In fact, depending on the focus of the class objectives, more modern, cross-cultural, non-canonical texts might be more beneficial to students, allowing them to relate to situations that are more reflective of their own day and age (Tseng, 2010), and therefore reinforcing the real-life contexts promoted by simulation (Park et al., 2016).

So, from a practical point of view, when tackling more difficult cultural aspects of a text in this way, instructors can promote the importance of their own research (and the sharing of findings) in the cultural understanding of texts. The activity scenario of the simulation can also be designed to reflect the importance of such research in the target language—including dedicating in-class hours to it if necessary. Using this cultural and historical background that they have collectively researched, students will have more practice with forming and vocalising their own interpretations of texts that are relevant 'to themselves and their society but which may be enriched and validated by useful information we might provide for them.' (Lazar, 1990, p. 209). Bearing this in mind, it is clear that, while more modern non-canonical texts might allow students to better relate to the overall realistic objectives of simulation, Simulation and Virtual Exchange provide learners with the right educational environment to benefit from both canonical and non-canonical literature. With the correct usage, both types of literature can be used with simulation, as long as the facilitator has clear learning objectives and is well equipped to anticipate problems beforehand. However, another problem that is associated with canonical literature (and less so with more contemporary choices) is the linguistic difficulty of the text, which is addressed below.

12.3 Language Adequacy: What Language is Best for Simulations Using Literature in EFL Learning?

Overly complicated linguistic terms and baggage (common to canonical texts) can become a barrier to learning when dealing with literature in a foreign language (Marley, 2001). This is especially true when looking at texts that include a vast amount of literary language that distorts and manipulates meaning (Lazar, 1990). However, Carter and McRae, who advocate for providing learners with more opportunities to experience and produce language in its more creative aspects, argue that introducing learners to more complex language offers its own advantages within language learning, such as opening doors to cultural awareness (Carter & McRae, 1996). Stephen Krashen also observes that, in order to improve language skills, students must be exposed to language 'a little beyond' their own level (Krashen, 1982, p. 22).

With this in mind, when it comes to selecting appropriate literature to use in Simulation and Virtual Exchange scenarios in terms of language adequacy, once more the principles of Vygotsky's 'Zone of Proximal Development' and Ryan's 'Principle of Multiplicity' are important to consider. They stand to prove that Simulation is a more effective learning method due to its cooperative qualities (Clapper, 2015), and therefore higher levels of work and understanding can be achieved. By working together to understand texts, learners using Simulation will be able to collectively access literature of a *slightly* higher lexical and semantic difficulty to that of their own individual level as they will be operating in the zones of proximal development of all the group members. This affords students valuable, meaningful exposure to target language texts and allows them to reap both the linguistic and cultural benefits (Carter & McRae, 1996; Krashen, 1982). This also minimises the problem of textual reduction[2] when using adaptations, a common solution to the linguistic problems presented when using canonical texts, through which language and cultural richness is sometimes lost (Bibby, 2014).

Having said that, it is important to ensure that the language level of the selected texts is not so difficult that even the combined group effort has trouble with understanding it. If a piece of literature is presented to learners as too difficult to understand without great effort, this will naturally produce within them a negative, demotivational effect (Bibbly, 2014; The British Council, N.d.) which is clearly not conducive to a successful learning environment. The fine line between selecting texts that are challenging for students but that do not motivate them must be respected.

Finally, it is also important for the instructor to identify the goals and objectives for students regarding literature and language so as to be able to emphasise work on those particular areas. As Marley (2001) states, language activities with literature are normally either concerned with the linguistic analysis of the text or sparking ideas for a variety of language activities. Therefore, in real classroom environments,

[2] Taking away important elements from a text by simplifying key cultural themes or language (for example) so as to make it more accessible for lower-level readers.

it would be a good idea for EFL students working with a piece of literature through Simulation or Virtual Exchange to collectively analyse and understand the text, most likely in the briefing stages. Then, in the subsequent stages, the text can be used as a springboard for other language activities that heavily rely upon communicative techniques (Marley, 2001) such as those used in Simulation and Virtual Exchange.

Similarly, student Simulation groups must be selected and monitored accordingly, so that the texts assigned are of a slightly higher level for the whole group, and not for only a handful of students, so as to avoid frustration. It would be prudent for the instructor to design the parameters of the simulation scenario in such a way that the use of key linguistic points that a text deals with, such as specialist vocabulary or phrasing, or grammatical structures, are encouraged throughout. In this way, knowledge of the key points of the language, presented in literature, is cemented through meaningful, life-like contexts provided by Simulation and Virtual Exchange, and therefore real learning is encouraged.

12.4 Length and Time: What Length of Text is Needed for Successful Reading in Simulations and How Much Time Should be Dedicated to It?

The length of a text and the time that it takes to work with it is another important factor that can cause issues for EFL learners (Lazar, 1990). The same can be said for Simulation, as has been mentioned in a previous chapter. Therefore, it is important to pay close attention to this aspect when choosing the type of literature that is going to be used in a Simulation or Virtual Exchange scenario.

It has been observed that, despite being aware of the benefits that studying target language literature can have for learners of a foreign language, both students and teachers alike simply feel that they do not have time to dissect a whole novel and complete all the other tasks and objectives that they have to achieve in class (Jones & Carter, 2012). Some students feel intimidated by the thought of working with longer pieces of literature and find the prospect of it daunting, while others find that the lack of repetition and cultural support in shorter texts makes them more difficult to work with (Bobinka and Romero, 2014).

Therefore, when presenting such texts through Simulation or Virtual Exchange, in order to make the most of the time at hand, it may be beneficial to adopt a different technique regarding the reading. Encouraging students to read outside of class time via Flipped Learning or Inverted Classroom,[3] a type of blended learning[4] technique, can reduce time spent reading in class and allow students to optimise their time. Flipped learning has been proven to be beneficial to EFL students in a number of ways. It facilitates the treatment of different types of literature/reading

[3] A classroom strategy in which students' complete readings at home and use class time instead to discuss the text and any subsequent questions they might have.

[4] An educational methodology in which online learning is used alongside face-to-face instruction.

texts in EFL classes, in secondary and higher education (Angelini, 2016; Challob, 2021) and promotes advancements in reading skills among secondary students (Hamdani, 2019). It has also been proven to work well alongside Simulations when presenting literature regarding linguistic, cultural, and social aspects (Angelini, 2016).

As well as being accessible to all learning types, this flipped approach to tackling reading literature invites learners to do topic reading and research outside of class hours, using the different technology available to them. In this way, in-class time is saved for asking and answering questions and discussion about the topic (Lage et al., 2000). By introducing literature to students through Flipped Learning in the briefing stages of Simulation so that they can work together to understand the text, and then allowing them to present their findings and offer an analysis in the debriefing, classroom time can be optimised, and students will still develop the essential skills that are involved in studying literature through Simulation.

However, it is important to remember that blended learning might not be possible in all situations (e.g., students may not have the resources at home to be able to carry out their independent investigation correctly). In this instance, a text that strikes a middle ground between students' fears about length can be sought. A piece of literature that is not too long so as to intimidate students, but not too short so as to leave them with too little to work with, like many Young Adult Fiction texts, for example. Group structures and cooperative activities can also be utilised to facilitate the treatment of literature through Simulation in the classroom if blended learning is not possible. In this way, while the time-saving benefits of Flipped Learning cannot be enjoyed, class time can still be used for group and peer interaction and engagement with the text and Simulation scenario. This use of time is also beneficial in that it is used to focus on the learner and develop their knowledge, experiences and interpretations—rather than having these things externally handed to them through the work of someone else.

12.5 Themes and Genres: What Thematic Content/Genre Has the Most Potential When Combined with Simulation and Virtual Exchange?

As with the length of a text, learners' attention will also be affected by the content of the text itself. Here, the second point previously mentioned about interesting and motivating the students is addressed. As reading always implies both a reader and a text (Fialho, 2019), it is important to remember not to divide these two entities, by making sure that textual content is relevant to learners and their realities. For instance, apart from the cultural, historical, and sometimes aesthetic significance present in many works of literature, they also afford the reader a personal approach. This provides learners with a backdrop against which to think, feel, and test their own beliefs (Morgan, 1993). If the content of the literature already relates to the

students in some way, this will facilitate these processes, particularly when looking at foreign language literature.

In turn, a crucial part of Simulation and Virtual Exchange is 'reality of function'. Here, participants must behave as though the Simulation situation were real (Levine, 2004). As the educational power of Simulation and Virtual Exchange is found within the reality of communication (Jones, 1995), it stands to reason that elements of the real world should be integrated into the text to achieve the proposed cooperative learning goals (Park et al., 2016). In fact, studies have shown that, generally, EFL students that work with literature identify realistic fiction to be among their preferred genres (Tseng, 2010).

Therefore, although it is clear that Simulation does not have to reproduce actual reality (Jones, 1995), by employing realist literature, students will have less difficulty when relating personally to a text and will have more motivation to work with it. Moreover, it is easier to relate real-world language experiences to texts that present real-world themes, so these types of texts help students to delve deeper into a language with a more familiar feeling and avoid unnecessary confusion. It might also be useful to work with a text that centres on only one or a few specific themes, especially if a work of speculative fiction has been chosen. This will help to make the purposes and roles of the proposed Simulation clearer and allow students to focus their language practice on a more specific area.

12.6 Conclusion: So, is There a 'Perfect' Text to Present Literature Through Simulation and Virtual Exchange?

Based on the analysis carried out throughout the chapter, while there is no definitive one-size-fits-all text to employ alongside Simulation, it can be argued that more contemporary, shorter, young adult novels/texts that tend to lean towards realism could be suggested as a good place to start. Similarly, texts that meet the previous criteria and that also centre on a specific theme could prove especially beneficial, with reading being done via flipped learning, if possible, in order to optimise classroom time.

That is not to say that adaptations of canonical novels and poems (perhaps again with more realist tendencies given the nature of Simulation and Virtual Exchange) should be ruled out completely. In fact, in specific instances, shorter sections of un-adapted canonical texts could be used to achieve specific learning objectives (whether they be cultural or linguistic). However, care must be taken to ensure that this approach (with adaptations or not) does not become reductive and that enough links can be made by learners to real-life scenarios—supporting the fundamental characteristics of simulation and virtual exchange.

When choosing literary texts to work with Simulation, it is possible to offer learners an integrated literary approach through which they are introduced to a level of English slightly higher than their own. This allows them to access more

advanced knowledge and skills, and work with texts that would not normally be considered appropriate for students of the same ability working individually - a critical step for one's own language development.

While this question has been approached from a language-learning perspective, it is possible to apply it to other subjects also. For instance, how can we choose literary texts to work with Simulation when aiming to achieve objectives in other areas, such as social science, religion, and citizenship, and even literature studies in the learners' native language. There are many areas to explore, and each one with its own unique objective that should be reflected in the choice of literature proposed for Simulation.

12.7 Summary

This chapter aims to provide readers with a guide on how to choose literary texts that will best support EFL learners when presented through Simulation scenarios. It addresses crucial areas that are normally identified as problematic when working with literature in general terms with students that are learning English: culture, language, length, and genre. Focusing on (but not limited to) students of secondary education, educators can hope to find in this chapter a comprehensive overview of the desirable features of these four categories that influence the choice of said texts based on the strengths of said methodology as well as their own educational objectives.

References

Angelini, M. (2016). Integration of the pedagogical models "Simulation" and "Flipped Classroom" in teacher instruction. *SAGE Open, 6*(1), 1–8.

Bibby, S. (2014). Criteria and creation: Literary texts and a literature textbook. *Journal of Literature in Language Teaching, 3*, 20–31.

Bobkina, J., & Romero, E. (2014). The use of literature and literary texts in the EFL classroom; between consensus and controversy. *International Journal of Applied Linguistics & English Literature,* (3)2. The British Council. Using literature—An introduction. Retrieved July 21, 2021, from https://www.teachingenglish.org.uk/article/using-literature-introduction

Carter, R. (2007). Literature and language teaching 1986–2006: A review. *International Journal of Applied Linguistics, 17*(1), 3–13.

Carter, R. & McRae, J. (1996). 'Look both ways before crossing: Developments in the language and literature classroom.' In R. Carter (Ed.), *Language, Literature and the Learner: Creative Classroom Practice.* 1st edn. pp. 1–15. New York, NY: Routledge.

Challob, A. I. (2021). The effect of flipped learning on EFL students' writing performance, autonomy, and motivation. *Education and Information Technologies*, 1–27.

Clapper, T. C. (2015). Cooperative-based learning and the zone of proximal development. *Simulation & Gaming, 46*(2), 148–158.

Devos, A., Torbenko, I., Doroshenko, T., Revenko, V., & Shuhaiev, A. (2021). The application of the simulation method in the in foreign language teaching in higher education institutions, the cognitive linguistic approach. *Journal of Educational and Social Research, 11*(4).

Fialho, O. (2019). What is literature for? The role of transformative reading. *Cogent Arts & Humanities, 6*(1)

Hamdani, M. (2019). Effectiveness of Flipped Classroom (FC) method on the development of english language learning of the high school students in Ahwaz. *International Journal of Applied Linguistics and English Literature, 8*(2).

Jones, C., & Carter, R. (2012). Literature and Language awareness: Using literature to achieve CEFR outcomes. *Journal of Second Language Teaching and Research, 1*(1), 69–82.

Jones, K. (1995). *Simulations: A handbook for teachers and trainers* (3rd ed.). Nichols Publishing.

Krashen, S. (1982). *Principles and practice in second language acquisition*. Pergamon.

Lage, M., Platt, G., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education., 31*, 30–43.

Lazar, G. (1990). Using novels in the language-learning classroom. *ELT Journal, 44*(3), 204–214.

Levine, G. (2004). Global simulation: A student-centered, task-based format for intermediate foreign language courses. *Foreign Language Annals, 37*(1), 26–36.

Lunce, L. (2006). Simulations: Bringing the benefits of situated learning to the traditional classroom. *Journal Of Applied Educational Technology, 3*(1), 37–45.

McRae, J. (1994). *Literature with a small "L."* Macmillan Education.

Maley, A. (2001). Literature in the language classroom. In R. Carter & D. Nunan (Eds.), *The Cambridge guide to teaching english to speakers of other languages.* Cambridge University Press.

Morgan, D. (1993). Connecting literature to students' lives. *College English, 55*(5).

Park, M., Conway, J., & Macmillan, M. (2016). Enhancing critical thinking through simulation. *Journal of Problem-Based Learning, 3*, 31–40.

Ravenscroft, S., Buckless, F., & Hassall, T. (1999). Cooperative learning—A literature guide. *Accounting and Education, 8*(2), 163–176.

Slavin, R. (2014). Cooperative learning and academic achievement: Why does group-work work*?*. *Anales De Psicología, 30*(3), 785–791.

The Council of Europe. (2020). *Common European Framework of Reference for Languages: Learning, teaching, assessment – Companion volume*. Council of Europe Publishing.

Tseng, F. (2010). Introducing literature to an EFL classroom: Teacher's presentations and students' perceptions. *Journal of Language Teaching and Research, 1*(1).

Vygotsky, L. (1978). *Mind in society*. Harvard University Press.

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Shifting Perspectives in Simulation: Implications to Pedagogical Learning of Preservice Teachers

13

Aki Murata and Jody Siker

Overview

The chapter explores how participating in simulations can help preservice teachers shift their perspective about teaching when they play assigned roles to present relevant ideas, are exposed to different perspectives of their peers and more experienced others, and integrate new ideas with their emerging knowledge. Using two examples of simulations that addressed the issues of classroom management, we will carefully unpack the opportunities simulations provide for perspective taking and shifting, important roles experts can play in simulations, and the importance of a supportive environment, where preservice teachers are expected not to have solid understanding of the issue, with opportunities to learn and grow.

Keywords

Preservice education · Preservice teacher learning · Professional learning community · Teacher collaboration · Simulation

Learning Objectives

By the end of the chapter, the reader should be able to:

- Describe how simulations can allow preservice teachers to develop new ideas about classroom issues and topics by forming opinions, listening to different ideas, revising their opinions, all the while deepening their understanding of the issue.

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- Understand how simulations can help preservice teachers meaningfully collaborate with colleagues and work together to make school decisions.
- Explain certain benefits and pitfalls of simulations involving preservice teachers and instructors, including how preservice teachers talk and problem-solve.
- Explore how experts can play critical roles in a simulation, and identify a few key processes to plan productive participation, including thoughtful presentation of expert ideas.

13.1 Introduction

One of the important challenges of preservice teacher education is to help the teachers gain new perspectives as professionals (teachers) in a short period of time. Most preservice teachers bring their own subjective and narrow understanding of classrooms based on experiences as students and gaining new insights as teachers can take a long time. In this chapter, we explore how simulations may provide focused experiences for preservice teacher learning by requiring them to play a role with informed opinions, participating in discussions with other participants with different ideas, being guided by more experienced education experts, and being supported to change their ideas. We present two examples of simulations where preservice teachers discussed how to handle classroom management issues, to trace how their thinking shifted through the simulations. We discuss the role of experts (teacher educators) in the examples, and how well-designed simulations have the potential to deepen preservice teachers' understanding of classrooms.

Preservice teachers typically require years of classroom experience before they can understand and handle complex classroom issues skillfully. Their early understanding of classrooms can be superficial and narrow, and they tend to quickly judge a situation and hastily try to solve complex problems. It is expected that they will make mistakes and change their perspectives multiple times before feeling confident as teachers. This change can be facilitated by the influence of peers and mentors. In this chapter, we present how preservice teachers can shift their perspectives and gain new knowledge about classroom issues through simulation activities. We use the actual simulation examples in which the authors of this chapter participated as a starting point for deeper analyses of the experiences.

13.2 Perspectives

The literature discusses many dimensions of challenges in preservice teacher education (Grossman, 2009; Stewart & Thurlow, 2000). Among others, preservice teachers' perceptions and understanding of teaching are often limited, primarily based on their own personal experiences as students, and relatively fixed. It requires

a long time and much effort to shift their mindset to imagine themselves as effective teachers (Mewborn & Timinski, 2006). For example, if they have primarily learned mathematics by repetition and drill of basic facts, it will not be easy for them to incorporate problem-based and discussion-focused mathematics instructional methods right away. Preservice teachers' beliefs about good teaching can also be fairly rigid because each preservice teacher's beliefs are subjective and personal. Well-designed preservice teacher education programs provide purposefully-designed experiences to expand their views and perspectives (Kang & Van Es, 2019).

Simulation can provide an ideal experience to expand preservice teachers' perspectives because it allows them to practice skills and emulate them in a safe setting as already indicated in Chaps. 3 and 10. In preservice education, simulation can provide settings in which preservice teachers take on the roles of classroom teachers and make sense of classroom situations with peers using the information provided, without the fear of publicly making mistakes in front of students or supervisors. In other words, preservice teachers (novices) can experience and see teaching as a working system with the central features explicitly highlighted, so that they begin to make sense of how decisions can be made using key elements. When faced with classroom situations, it is difficult for preservice teachers to know what to pay attention to (or not), so simulation can narrow their attention to important aspects of classroom processes. For example, when faced with varied learning needs of students, a simulation can help preservice teachers focus on a few key elements of learning to create differentiated groups and help plan learning activities that maintain high expectations for all groups. A simulation can represent a classroom as a context where preservice teachers can attempt to solve a possible problem by focusing on a few important and manageable elements, discussing with other participants, revising their approaches as they gain a better understanding of the situation, while simultaneously gaining critical knowledge about teaching.

In a simulation, participants find solutions to certain problems or situations in a given scenario while learning about related topics, proposing ideas, negotiating, and making decisions (Angelini, 2021). It is likely that preservice teachers may come to incomplete or misguided decisions at the start of a simulation, but through discussion with peers, they can flesh out their understanding of the problem and solutions. They are also influenced by facilitators who can guide them toward change by aligning perspectives.

Facilitators can draw on collegiality and expertise to build trust that allows for gradual change through discussion. Simulations can provide a safe environment for preservice teachers to revise their thinking and decisions. Facilitators play a role to moderate the safety of the simulation by intervening and refocusing discussions (de Wijse-van Heeswijk, 2021). In physical K-12 classrooms, many teachers' instructional decisions are final and cannot be reversed (at least for the same students), but in a simulation, preservice teachers can safely entertain different decision paths while being supported by other participants. They can make suggestions and share opinions by taking on a role outside of their experience and attributing their ideas to

this imaginary profile. It is a context of collaborative problem-solving, helping build a foundation for a professional community where teachers support each other's learning.

13.3 About the Simulation Examples in This Chapter

In this chapter, we explore how a simulation can expand preservice teachers' perspectives as they play the roles of school professionals in a supportive collaborative meeting scenario. The authors of this chapter participated in a Virtual Exchange project using simulation in March 2021, which explored different classroom issues represented in scenarios (e.g., teaching methodologies for ELS, using lesson study for professional development). Each simulation group was composed of five or more participants, who were assigned different roles as follows: (1) Head of the school, (2) Pedagogical Advisory Board advisor, (3) Parent Association representative, (4) English Department representative, (5) Service-Learning Department representative, and (6) Special Education Department representative.

Each simulation group included a mix of preservice teachers, in-service teachers working toward a credential, university professors, teacher educators, and/or educational researchers from different educational disciplines. All participants were given the scenario prior to the simulation and asked to think through the situations before joining the team. It is also important to note that these teams are international in nature and participants came from different countries (Spain, Tunisia, Romania, England, Austria, and the United States). To build a community in the simulation group, each team met prior to the simulation meetings during which we addressed the scenarios. We discussed education in our various countries and got to know each other so that everyone could feel safe while participating in the simulation.

During the simulation, participants were tasked with talking through the scenarios by taking the perspective of their assigned profile. In the conversation, participants loosely follow a problem-solving structure of building relationships, defining the problem, analyzing the problem, and deciding on action steps (Musti-Rao et al., 2011). While different chapters of this book will address different aspects of the simulation experiences, we will focus on one of the challenges of the scenario (see Chap. 20: 'School of Valtance' simulation):

> Classroom management: Ten formal complaints have been passed about the ineffective learning environment during English lessons. Students are talking while the teacher is talking, moving around the room freely, and not attending to instruction. ValPAR (the Valtance Parent Association) has required measures to control discipline and the management of the classes during the English lessons bearing in mind that teachers are sought to maintain order and to keep the group on task and moving ahead. How can ValED teachers anticipate when misbehaviors are likely to occur and be proactive to prevent them?

The most effective interventions must be subtle, brief, and almost private. In addition, the teachers need to create a classroom environment with clear expectations and a welcoming tone. Classroom management should be integrated with

classroom activities. Instruction must be engaging and incur that students are active learners. Teachers must create a positive classroom environment where students can take risks and do their best work.

In the following sections, we will first introduce current perspectives and theories on classroom management, followed by two cases of simulation to illustrate how this scenario played out in two teams of which the authors took apart. We will present focused illustrations of interactions from each team, exemplifying the learning of preservice teachers through the simulation.

13.4 Classroom Management Perspectives/Theories

Preparing students to implement models of classroom management is complex and they often have incomplete knowledge in this area. There is evidence that preservice teachers often do not receive enough instruction about classroom management to effectively manage and instruct students who have behavioral difficulties (Oliver & Reschly, 2010). Classroom behaviors are improved when teachers know about the levels of intervention, starting with a school-wide system and telescoping down to the classroom and then the individual student level. One commonly used and current school-wide approach is called positive behavioral intervention and support (PBIS; Horner & Sugai, 2015). This model scales up ideas from behavior analysis to establish a school-wide culture that promotes shared values, such as respect, responsibility, and community. There are typically three levels, universal, small group, and individual. There should also be support for students who need more intensive interventions, which should be provided at additional levels. The school culture and development of shared values can be considered one step in a complex system of supporting students' social and emotional development.

At the individual level, a student's behavior can be interpreted as a communication of an unmet need or an issue for which the student does not have the skills to communicate in a calm, verbal way (Greene & Winkler, 2019). Greene and Winkler (2019) discuss a systemic approach of collaborating with students to better understand the skills they are lacking and examining how they communicate unmet needs. This approach, called *Collaborative and Proactive Solutions*, is built around the assumption that students need instruction about how to understand their own behaviors and communicate their needs. Preservice teachers may interpret behaviors and school-wide systems in different ways, so talking through these ideas challenges previous experiences and knowledge.

13.5 Motivating Good Behaviors for Learning Through Belonging (Case 1)

In this simulation team, there were five preservice teachers who played various assigned profiles stated above, along with one teacher educator (first author of this chapter) who provided insight as a pedagogical advisor, and another teacher

educator as the head of the school. The head of the school asked the pedagogical advisor to start this portion of the simulation by stating her ideas regarding the situation. The advisor explained how classroom management should not be solely seen as punishing children and controlling/correcting their behaviors, but rather as creating safe classroom communities where students are motivated and engaged to learn (thus providing fewer opportunities for unwanted behaviors). Having classroom routines that students can anticipate what is going to happen during their days creates safety, and a sense of belonging to want to work together helps students monitor their own behaviors.

Following this statement, a few preservice teachers shared their ideas. Clarissa, who was given the role of special education advisor (all names are pseudonyms) said how using everyday life examples in teaching English learners helped increase engagement so that the students could communicate what they already knew, to make the language learning more meaningful. Lilly (as the service-learning specialist) said how teachers could plan and teach creative lessons that were more interactive for students. At this point, another preservice teacher, Lindsey (as head of the parent association), shared her thinking:

> Lindsey: … if the classroom atmosphere is not positive, like students chit-chatting in the back, it will make the lesson less effective. These students make it difficult for other students to understand, and make the lesson useless. And they won't be able to do the homework because they don't understand what is taught in class, and parents can't help, either. I think classroom management is the most important thing in teaching.

What Lindsey says above is her reality, and developmentally appropriate for a preservice teacher who has not spent many hours in classrooms. She perceives that the time she spent planning a lesson, to make the lesson adequate, could be easily ruined by a student's misbehaviors. She added how no student will learn as a result of the misbehavior, then not be able to do homework and their parents would not be able to help. It is important to note that while Lindsey is making a considerable leap in her argument in this hypothetical case, it is the reality for her as a new preservice teacher, and we must accept where she is in her professional learning trajectory.

What followed Lindsey's sharing is other preservice teachers contributing their ideas to shift the discussion path to emphasize classroom community, without explicitly disagreeing with Lindsey:

> Chrissy (as head of the English department): I think that creating a sense of community is most important as a part of classroom management …
>
> Aki: … when students are talking to each other, like chit-chatting, telling them not to talk and silencing will not guarantee learning, right? The students may continue to think about other things outside of the lesson while not talking. Behavior is just one indicator of learning, but there are so many other things that can be going on. If students are talking, they may be excited about something about the lesson. Invite them to bring the ideas to the whole group. Other students may learn, too.
>
> Chrissy: … maybe small behaviors do not need to be corrected. We want to understand the reasons for these behaviors. We can let them talk it out in lessons …

> Clarissa: … also, as teachers, we are modeling our expectations. We are not perfect. Mistakes are part of life, and we can make them (mistakes) a part of the lesson too …

As illustrated above, the group took on Lindsey's initial idea and example and extended it productively toward solutions on how to work with student misbehavior (chit-chatting). Lindsay listened carefully to everyone's ideas. She then changes the direction by presenting another example of student misbehavior:

> Lindsey: … I agree with everybody that the classroom environment is important. And anticipating misbehaviors and handling them in face-to-face classrooms are easy, but it is harder with online teaching. Some students may turn off screens and do other things. And if one student misbehaves, it will distract the rest of the class. What can we do about that?

It is clear with her new example that Lindsey is still struggling with the notion of how to handle the imperfect behaviors of students. The head of the school calls on the pedagogical advisor for her input:

> Aki: … It is important to establish expectations in classrooms at the beginning of the school year that all students belong, they are liked, and all their behaviors are acceptable as long as they don't hurt each other physically or emotionally. One bad behavior will not define the student, and they will always be a part of the community, but we also want to understand why behavior happens if it is not productive for everyone's learning. When a behavior is observed that makes us (teachers) curious why, we want the student to be able to explain it back to us. When they do, it then becomes an issue for the classroom community to decide whether or not it is acceptable. If the teacher quickly judges and tells the student to stop behaving in a certain
>
> way, it can become a power struggle. Trust and relationships in the classroom community will work better to change behaviors.

Following this, another preservice teacher eagerly chimes in:

> Yana (as English department advisor): Students can explain what is bad in their behaviors. Teachers can do that for their behaviors, too. This creates shared values … I don't like to call it "control" as I don't want to be a bossy teacher.

The case above illustrates how preservice teachers may perceive classroom management as the persistent and most challenging aspect of teaching (Henson, 2001). As their understanding of classroom interaction is limited, many preservice teachers at this career stage may see lessons as choreographed plays, so any interruptions are unwelcome. Thus, they attempt to stop these interruptions as quickly as they can. With years of teaching, many experienced teachers come to learn that simply extinguishing a behavior in one place will not change the root cause. If we want to make a sustainable change, we must try to understand where the behavior is coming from and why, and take a purposeful approach to change it or learn to work with it. As research shows, creating safe classroom communities and nurturing positive community experiences will motivate students to work more productivity for the sheer desire to belong (Ginsburg & Wlodkowski, 2019; Oldfather & Dahl, 1994).

If the pedagogical advisor was to present a different and more-traditional view that strict and structured behavior management is important and necessary, the discussion in this simulation group could have taken a different direction. In fact, if preservice teachers come from traditional US classrooms, they are likely to have experienced classroom management programs based on positive and negative reward systems (e.g., Assertive Discipline). These programs focus on changing behaviors using external stimuli but rarely address the reasons and needs behind the behaviors. Thus, many preservice teachers in this situation could come with beliefs that controlling behaviors externally is important, not knowing that motivating students through social connections is possible. The flexibility and the eagerness of most of the preservice teachers in this simulation group to take on the new ideas were refreshing. While Lindsey remained uncertain about how to handle concrete classroom management situations, she was also feeling the pressure from her peers that creating a safe classroom environment might work to manage unwanted behaviors. It is also possible that Lindsey consciously took a strong stance because of the profile she was assigned in the simulation—a representative of the parent association—for which the association is the one who raised the management issue in the scenario.

13.6 Collaborating to Develop a Consistent Plan (Case 2)

In this simulation team, there were five participants: four preservice teachers preparing to teach English to learners who speak other languages and one special education teacher educator (the second author of this chapter) in the United States. The preservice teachers who were present played the following roles: one head of school and two English teachers. I played the role of the special education teacher.

The classroom management discussion started with me stating that this scenario was my favorite and the head of school suggested that I set up the discussion. I described classroom management as an umbrella term that includes the rules, procedures, classroom environment, how students participate, how teachers transition from one task to the next, and how to address students' behaviors. In this definition, most of "classroom management" falls under the teacher's control. If something goes awry, it is an opportunity for the teacher to revisit rules, procedures, transitions, and how students feel in the classroom.

Misbehaviors happen for many reasons, but I wanted to frame the discussion around what teachers can do to be more consistent and proactive in their planning to avoid a discussion in which the teachers and head of school would blame students for their behaviors.

After the introduction, Lena (all preservice teacher names are pseudonyms) said that we should build on previous behaviors and teacher reactions and keep a record of these so we can plan how to react as behaviors arise again. She stated the importance of a "Plan B" for reacting to students' misbehaviors.

> Lena: Maybe what we can do first is notice the misbehavior, like after it happens you can call the student and tell them that next time if you feel you need to do this, then you just raise your hand and tell me. When you acknowledge it, you need to make them know that what they did was noticed and then you can talk about it in class in a general way.

Lena's comment about acknowledging the behavior and allowing the student to identify their own needs reflected her understanding that behavior is completely under the student's control. Although many teachers believe this, behavior can also be a student's attempt to communicate unmet needs (Greene & Winkler, 2019). After Lena's comment, I shifted the discussion to individual aspects of classroom management, such as teaching students alternative behaviors and behavior planning, then I tried to reenter my role by asking the English teachers about the other teachers in the department. Do they all have clear rules and procedures for their students?

> Julia: We need to work on that. I don't know how the rest of the teachers' work, but I try to create an atmosphere of respect and to set some rules and limits, but to be close to my students and make sure I know them. If they did something they can tell me because there is trust, but I guess it's hard for other teachers.

> Jody: You have to build trust; you don't just get it. Some of the teachers have trouble with that. So, you can come to me as the special education teacher to make plans.

Since I mentioned plans, I then proceeded to talk about the process of behavior intervention plan meetings and answered questions about behavior plans, non-violent crisis intervention, and responding to dangerous behaviors instead of allowing another student to build on what Julia was talking about in terms of building trusting relationships with students. After talking a bit more about collaborative plans, we brainstormed ways to prepare all of the teachers in the school to work with students with challenging behaviors and agreed to add this topic to the weekly professional development sessions that we had decided to conduct earlier in the simulation.

Julia shifted the conversation to an idea about being more consistent across the school, which demonstrates an introductory understanding of PBIS. Julia presented the first step and then I built some instruction about the multiple tiers of PBIS in the following interaction. When a preservice teacher shares developing idea, the expert notices it, and provides resources, tools, and terminologies to solidify their ideas.

> Julia: I think we should develop a classroom management plan that is adapted to our students in the school. If we all work in the same way, then the students will be able to learn the rules and procedures better.

> Jody: …We have school-wide expectations and rules that the students help develop too and then we have another level for students who need more support and a third level for students who need individual behavior plans…

This discussion continued and followed the same pattern as the earlier discussion with Julia agreeing and wanting to have a consistent system and Lena talking about teaching as the work of developing plans, so deviating from the plan to teach social skills and build community would take time away from planned instruction. She

agreed that it would be useful, but not if it takes away from her prepared lesson. After hearing from Julia, Lena conceded that as long as the department and school community was teaching skills to help students deal with frustration and communicate better, it would be a good practice to integrate into lessons.

To summarize, I supported the discussion by building on preservice teachers' incomplete understanding to insert instruction and resources. Part of the role of a special educator is to lead collaborative teams, but the head of the school should have co-led the team with her leadership role. Sarah (head of the school) was mostly silent throughout the discussion. She might be unfamiliar with what someone in her role would say during a discussion about classroom management or she might have been more reserved and unsure how to join the conversation. Lena offered original ideas in response to the scenario and occupied her role as an English teacher in the school. Her comments reflect what novice teachers say about classroom management, similar to Lindsay from Case 1. She focused on planning lessons and delivering curriculum and suggested that we ignore misbehaviors. The research shows that planned ignoring can be effective in some cases, but should not be the only strategy in response to misbehavior (Gable et al., 2009). Preservice teachers should be prepared to understand behaviors as communications of unmet needs (Greene & Winkler, 2019) and analyze behaviors systematically by collecting data about antecedents and consequences (Anderson et al., 2015).

Finally, Julia emphasized working together to develop plans and consistent practices as a school. A school-wide approach to PBIS would allow for multiple layers of support for students, including intensive interventions that would support students who need individualized support to learn alternative ways of expressing their needs (Horner & Sugai, 2015). There is emerging evidence that restructuring schools to use restorative practices can disrupt a cycle of trauma and exclusion for students (Dutil, 2020; Ryan & Ruddy, 2015). This simulation allowed participants to grapple with these issues and use a problem-solving approach to consider ideas and make a plan for the fictional school.

13.7 Reflections as Teacher Educators

In participating in simulations, we (authors of this chapter) experienced how adaptive and malleable the preservice teachers' perceptions are in general, and what important roles teacher educators can play in simulations in forming new perspectives. We both felt, in our respective simulation teams, how the preservice teachers were eager to take on expert knowledge provided, make sense of the situation in relation to the new ideas, and quickly modify their statements to align with the new learning. We also often caught ourselves taking the role of teachers/professors unexpectedly when preservice teachers seemed uncertain about their ideas while playing the roles that demanded different expertise. For example, Case 2 demonstrated that participants bring in their own experiences outside of their assigned profile, so if the team had been different, a completely different discussion

and set of action steps could have arisen. Simulations, such as this one, depend on the commitment of each person to occupy their role and maintain a suspension of disbelief (Dieker et al., 2014). I (Jody) did not achieve this ideal because I deviated from my profile as a colleague to lead instruction about classroom management and school-wide approaches to behavioral intervention.

Although the profile of special educator would allow for some conversations about behavior and individualized approaches, I crossed into my actual role as an instructor to frame the discussion. As teacher educators, we privilege certain information and when participants talked about their expertise and experiences, I added special education instruction and resources, possibly beyond what the special education profile should have added, including giving feedback to the preservice teachers about their responses. When preservice teachers presented pieces of their understanding, the teacher educator connected the pieces into formal models and ideas.

We reflected on these experiences separately and together and agreed that it is one of the strengths of simulation practices when experts (teacher educators) could provide situation-based knowledge to novices (preservice teachers) when the novices were pressed to take a stand and express their ideas. Bransford et al. (2000) explain how novice and expert knowledge interact during instruction, with novices presenting incomplete, sometimes isolated knowledge and experts making connections to a system of knowledge. Being assigned an unfamiliar role in simulation, the novice must quickly form their opinions by gathering information and knowledge that they have immediate access to. In the process, they become aware of what they do not know and what they are uncertain about. In this vulnerable space, they are more ready to hear experts' ideas and can integrate the new knowledge into their understanding because they are aware of what they do not know. The experts can often systematically present how an issue is surrounded by and connected to other factors in a situation, and make clear connections among the factors, so that the novice can begin to understand how the issue does not exist alone in the setting but can be understood and solved by attending to many related factors in the system.

13.8 Summary

Having grounded classroom experiences will help preservice teachers come to solutions beyond the superficial and simplistic when faced with a problem. While they bring their own knowledge of classrooms (mainly as students), being a teacher requires a whole new set of skills and thinking. Becoming an effective teacher usually takes years of classroom experiences and working in teams to solve problems. Using simulations is a potential way to help preservice teachers gain experiences in various classroom-based and collaborative scenarios, helping them imagine their roles as teachers and develop a new understanding of the profession before taking responsibility for classrooms. The presence of experts in the simulation groups is also critical in shifting preservice teachers' perspectives and beliefs,

as the preservice teachers are keenly aware of what they do not understand about the issue at hand while preparing to play an assigned role, and thus are ready to integrate new information and knowledge into their thinking.

Using simulations to navigate detailed scenarios with experts will help prepare teachers to fill these roles in their future schools. Preservice teachers actively imagine various scenarios from different perspectives before they experience them, so playing different profiles becomes possible. Multiple perspectives shared in a collaborative analysis of scenarios can help participants learn about what other members of school teams might think and how they might approach the same situation. Including various scenarios also allows participants to share their differing expertise and experience. Thus, they can situate themselves as learners in other scenario discussions. The next step for participants is to reflect about their experiences and what they learned from occupying different profiles in the collaborative discussions.

References

Anderson, C. M., Rodriguez, B. J., & Campbell, A. (2015). Functional behavior assessment in schools: Current status and future Directions. *Journal of Behavioral Education, 24*, 338–371. https://doi.org/10.1007/s10864-015-9226-z

Angelini, M. L (2021). *Learning through simulation: Ideas for educational practitioners*. Switzerland: Springer Briefs in Education.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn* (Vol. 11). National academy press.

Dutil, S. (2020). Dismantling the school-to-prison pipeline: A trauma-informed, critical race perspective on school discipline. *Children & Schools, 42*(3), 171–178. https://doi.org/10.1093/cs/cdaa016

Dieker, L. A., Rodriguez, J. A., Lignugaris, K., & B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education, 37*(1), 21–33. https://doi.org/10.1177/0888406413512683

Gable, R. A., Hester, P. H., Rock, M. L., & Hughes, K. G. (2009). Back to basics: Rules, praise, ignoring, and reprimands revisited. *Intervention in School and Clinic, 44*(4), 195–205. https://doi.org/10.1177/1053451208328831

Ginsberg, M. B., & Wlodkowski, R. J. (2019). Intrinsic motivation as the foundation for culturally responsive social-emotional and academic learning in teacher education. *Teacher Education Quarterly, 46*(4), 53–66.

Greene, R., & Winkler, J. (2019). Collaborative & Proactive Solutions (CPS): A review of research findings in families, schools, and treatment facilities. *Clinical Child and Family Psychology Review, 22*, 549–561. https://doi.org/10.1007/s10567-019-00295-z

Grossman, P. (2009). Research on pedagogical approaches in teacher education. In *Studying teacher education* (pp. 437–488). Routledge

Henson, R. K. (2001). Relationships between Preservice Teachers' Self-Efficacy, Task Analysis, and Classroom Management Beliefs. *Reports—Research; Speeches/Meeting Papers*. https://files.eric.ed.gov/fulltext/ED450084.pdf

Horner, R. H., & Sugai, G. (2015). School-wide PBIS: An example of applied behavior analysis implemented at a scale of social importance. *Behavior Analysis in Practice, 8*(1), 80–85. https://doi.org/10.1007/s40617-015-0045-4

Kang, H., & van Es, E. A. (2019). Articulating design principles for productive use of video in teachereducation. *Journal of Teacher Education, 70*(3), 237–250.
Mewborn, D. S., & Tyminski, A. M. (2006). Lortie's apprenticeship of observation revisited. *For the Learning of Mathematics, 26*(3), 23–32.
Musti-Rao, S., Hawkins, R. O., & Tan, C. (2011). A practitioner's guide to consultation and problem solving in inclusive settings. *Teaching Exceptional Children, 44*(1), 18–26.
Oldfather, P., & Dahl, K. (1994). Toward a social constructivist reconceptualization of intrinsic motivation for literacy learning. *Journal of Reading Behavior, 26*(2), 139–158.
Oliver, R. M., & Reschly, D. J. (2010). Special education teacher preparation in classroom management: Implications for students with emotional and behavioral disorders. *Behavioral Disorders, 35*(3), 188–199.
Ryan, T. G., & Ruddy, S. (2015). Restorative justice: A changing community response. *International Electronic Journal of Elementary Education, 7*(2), 253–262.
Stewart, C., & Thurlow, D. (2000). Making it their own: Preservice teachers' experiences, beliefs, and classroom practices. *Journal of Teacher Education, 51*(2), 113–121.
de Wijse-van Heeswijk. M. (2021). Ethics and the simulation facilitator: Taking your professional role seriously. *Simulation & Gaming*, 52, 312-332

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Simulation in Preparing Teachers to Work with Learners with Diverse Abilities

14

Jody Siker

Overview

The field of special education in the US is currently using simulation to prepare teachers to work with all students and collaborate effectively (Dieker et al., 2008; Ludlow, 2015). Some simulations involve high-fidelity experiential learning wherein participants occupy particular roles to collaborate and problem-solve through scenarios (see Angelini, 2021). The idea behind this type of simulation is that transformative learning needs to include "a 'disorienting dilemma,' or crisis, which requires learners to confront and evaluate their underlying beliefs and assumptions using both personal reflection and reflective discourse with others" (Scorgie, 2010). The simulation described in this book, the Valtance simulation (see Chap. 20.2, Angelini, Angelini Learning through simulations: ideas for education practitioners, Springer, 2021), presents disagreements between various stakeholders that need to be addressed and resolved by a team meeting. The conclusions of the team are unknown at the beginning of the unscripted discussions, but there is a framework in place. Each participant prepares their role based on a profile and reads through scenarios that indicate each profile's preliminary opinions. During simulated committee meetings, participants occupy roles such as (a) head of the school, (b) pedagogical advisor, (c) representative from the parent association, (d) English teacher, (e) service learning teacher, or (f) special education teacher. The Valtance team conducts unstructured conversations around several challenges, each presenting a dilemma or difference of opinion. This chapter will review some simulations

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used to prepare special education teachers and explore the efficacy of this practice. Tenets of various simulations are integrated into the Valtance simulation described below.

Keywords

Special education teacher preparation · Simulations · Problem-based learning · Collaboration · Team meetings

Learning Objectives

By the end of the chapter, the reader should be able to do the following:

- Define various types of simulations and consider how they might be applicable to special education teacher preparation.
- Explain the required components of a high-quality simulation conducted with or without technology.
- Describe the cyclical process of reflection that allows for transformative learning.

14.1 Introduction

In special education, teachers are prepared to provide specially designed instruction to learners with diverse abilities and to collaborate with families and colleagues to determine the individualized services needed (Brownell et al., 2019; Darling-Hammond & Bransford, 2005). Pre-service teachers need to acquire knowledge and skills regarding instructional methodology, behavioral methods and strategies, how to collaborate with professionals and families, and ways to advocate for students with disabilities, among other skills. In teacher preparation programs, pre-service teachers read about these topics and can apply the ideas in discussion or through course assignments.

They also participate in clinical experiences working with mentor teachers in their classrooms. However, pre-service teachers rarely practice collaboration and advocacy skills they are required to use in team meetings where they work together with colleagues, professionals, and families. Recently, various programs have started to include different types of *simulations* to support transformative learning of these important skills.

There is preliminary evidence that simulations using technology in virtual reality, mixed-reality, and "in real life" settings improve pre-service teachers' use of instructional techniques (Dawson & Lignugaris/Kraft, 2017; Fraser et al., 2020;

Garland et al., 2012), application of classroom management skills (Hudson et al., 2019; Murphy et al., 1987), and ability to collaborate with colleagues (Dotger & Ashby, 2010; Driver et al., 2018; Ochoa et al., 2004; Robbins et al., 2019) and families (Accardo & Xin, 2017; Dotger & Coughlin, 2018; Luke & Vaughn, 2021). These experiences have the potential to allow students to learn targeted skills in a safe environment where they can make mistakes without offending colleagues, families, or students (Dieker et al., 2014). The simulations must focus on critical behaviors and involve "(a) personalized learning, (b) suspension of disbelief, and (c) cyclical procedures to ensure impact" (Dieker et al., 2014, p. 22). This chapter provides examples of innovative applications concerning various types of simulations and describes an example of an international virtual simulation that supports teacher candidates in learning about how to collaborate with colleagues in collaborative school teams.

14.2 Simulation Structure and Definition

Special education teachers must be prepared to modify, adapt, collaborate, and advocate because they work across multiple challenging contexts with students who require additional services. These skills require practice beyond what they learn in traditional teacher preparation programs even though most programs involve opportunities to work in classrooms. Simulations allow pre-service teachers to apply what they have learned before working with their actual students, families, and colleagues. Simulations are meant to supplement actual classroom learning and collaborative experiences, not to replace them. For these experiences to be effective, Dieker and colleagues (2014) describe a cyclical process called the Action Review Cycle (Parry et al. 2008). Instructors must carefully design simulations to include the three steps of (a) developing a purpose for the simulation, (b) conducting the simulation, and (c) reflecting on the simulation. Reflections also follow a three-step process of describing what happened, why it was significant, and action steps to improve practice (Kolb & Lewis, 1986).

Effective simulations involve active and collaborative problem-solving (Angelini, 2021). The simulation described in this book has three components. First, the facilitator prepares materials and gives them to participants. This *briefing step* includes providing profiles for participants and developing dilemmas for teams of participants to talk about. In this case, materials also include a mission statement and overview of the School of Valtance and six dilemmas about the following:

1 Teaching methodologies in the English language classroom.
2 Classroom management.
3 Shared teaching through lesson study.
4 Literature, storytelling, and drama in English.
5 Multiple modalities and teaching and assessing.
6 Crisis management and online teaching.

Participants review these materials prior to the simulation. Second, the *action phase* occurs in which participants discuss the scenarios following their assigned profiles. They debate, discuss, and negotiate their assigned perspectives and collaborate to solve problems presented in the dilemmas. Third, the *debriefing phase* allows participants to reflect on their experiences individually and across groups.

This final phase allows participants to follow the structure suggested by Kolb and Lewis (1986). Before discussing this simulation in more detail, it is important to understand the state of simulation use in special education teacher preparation programs. Teacher education programs use several different types of simulations that can fit into three categories: (a) puppetry simulations, (b) single-user simulations, and (c) multi-user environments (Bradley & Kendall, 2014–2015). There are other ways to parse the many types of simulations used in education, but these categories differentiate the types of environments and participants. The next sections will describe simulations in these categories and consider how the Valtance simulation might integrate and support the lessons learned from the literature. The Valtance simulation builds on the reflective process of other simulations while also being international in scope and relatively cost-effective.

14.2.1 Puppetry Simulations

Puppetry simulations work with a digital interface and involve an avatar or well-trained actor who responds in particular ways to one or a small group of pre-service teachers based on a decision tree developed by a teacher educator. The actor's responses depend on the participant's statements. Some studies describe the use of TeachLivE™, or Mursion, to conduct puppetry simulations (Accardo & Xin, 2017; Dieker et al., 2014; Driver et al., 2018; Luke & Vaughn, 2021) and others forgo the virtual actor in favor of a "standardized patient" (Dotger & Ashby, 2010; Dotger & Coughlin, 2018). TeachLivE™ uses avatars controlled by trained actors who respond in planned ways to high- and low-level responses. This application has been applied in many different ways for different purposes; the idea is that pre-service and in-service professionals can practice specific skills in a recursive manner without a real-world consequence.

Although commonly used to support pre-service teachers' practice teaching in the classroom (e.g., Dawson & Lignugaris/Kraft, 2017), TeachLivE™ can also allow teacher candidates to practice collaborating with adults and colleagues. Luke and Vaughn (2021) described how to integrate a simulation into a course about family collaboration by using a simulation with a parent avatar. The actor behind the avatar can see the participant through a webcam and will adjust their behavior based on body language and comments. Meanwhile, a facilitator coaches the participant in real time. In a similar application, Accardo and Xin (2017) used TeachLivE™ to conduct collaborative meetings with three students playing school professionals and an avatar parent. When compared with a similar conversation with peers in the classroom, Accardo and Xin (2017) found that the TeachLivE™ group scored higher in their ability to facilitate and make appropriate instructional

decisions. They attributed this to the existence of an unknown person playing the parent. This application allowed for the group problem-solving practice inherent in the Valtance simulation and also included an unknown team member to increase the perception of reality. The Valtance simulation included participants from around the world who had only met each other once previously, allowing for more suspension of disbelief.

Another application of TeachLivE™ aims for participants to practice collaborative conversations with colleagues. Driver et al. (2018) conducted a series of simulations in which pre-service special education teachers participated in virtual conversations, such as talking with an avatar playing a general educator, related service provider, paraprofessional, school administrator, or parent. These simulations allowed participants to practice "(a) positive turn-taking; (b) responsive listening; (c) follow-up questioning; (d) non-confrontational language; (e) welcoming body language; (f) building rapport; and (g) seeking to understand others' perspectives" (Driver et al., 2018, p. 62). Participants can pause and receive feedback from professors and peers or ask questions. Robbins et al. (2019) allowed individuals to act as special educators in co-planning sessions with a general education teacher avatar. In this application, the researchers also measured vicarious learning for peers watching the simulations. Participants did not need to be an active part of the simulation to improve their collaboration skills. This simulation improved the professional communication skills of all students. Observing peers also improved students' ability to collaborate, discuss how to support students with disabilities, and communicate with other school professionals.

Spencer et al. (2019) also simulated instructional planning meetings with co-teachers, one played by an avatar or a peer to compare more typical role-play experiences to the simulation in TeachLivE™. Participants used a substitution approach that rotated participants into the meeting to interact with the avatar or a peer in the role-play condition. They found that the simulation groups reported their experiences as more useful and realistic than those in the role-play condition.

Since the cost of a virtual puppetry program can be prohibitive and role play can be less effective, some teacher preparation programs have turned to the medical school model of using "standardized patients". Standardized patients are actors employed by medical educators to portray patients with particular ailments so students can practice diagnosis skills before their decisions affect actual patients. Dotger and Ashby (2010) retrained actors used by a medical school as standardized patients to become "standardized individuals" and portray a paraprofessional, or educational assistant, being supervised by the student participant. In these simulations, individual students practiced a collaborative team meeting in which the paraprofessional was trained to raise particular items that lightly challenged the student's training. The simulation was planned to test students' convictions and see how they might advocate for students when pushed by a paraprofessional who disagrees. Results indicated that students often deferred to the paraprofessional's judgment, but also appreciated the opportunity to practice conversations that they might not have otherwise (Dotger & Ashby, 2010).

In another study, Dotger and Coughlin (2018) trained a standardized individual to portray a parent during a meeting with pre-service or in-service school leaders, or administrators. Findings indicate that school professionals need to choose their words carefully when talking with parents, but also that simulations allow for practice and reflection that bridges what is learned through coursework in a low-stakes environment. These collaborative simulations are effective because they allow for shared practice of specific, targeted skills needed to resolve situations that occur often in the job. The Valtance simulation did not involve puppetry, but it shares the tenets of the above simulations by including relatively unknown participants playing roles before being asked to actually occupy these roles in their careers. Discussing issues through the lens of another can provide a safe environment to grapple with realistic issues.

14.2.2 Single-User Simulations

A second type of simulation includes just one participant interacting with a scenario or virtual environment. McPherson and colleagues (2011) studied the use of SimSchool[1] with pre-service teachers in an online course. They customized one student in a virtual classroom to demonstrate challenging behaviors as the participant implemented a programmed lesson plan. Participants (n = 151) were able to redo their lessons and make changes to better address the student's behavior. They improved their teaching self-efficacy and teaching skills more than a control group who did not participate in the SimSchool activity. This type of simulation can be more cost-effective than the virtual puppetry simulations, but the range of responses of virtual students is limited and pre-programmed. It also removes the collaborative component that allows vicarious learning (e.g., Robbins et al., 2019) and drives participants' critical thinking.

14.2.3 Multi-User Environments

The ability to collaborate with others may increase the effectiveness of simulations, especially when participants are geographically separated. Hartley and colleagues (2015) used Second Life©[2] for distance education. In Second Life© participants can create their own avatars and interact with other human-run avatars in a virtual space. This application has also been used by Nussli et al. (2014) to allow collaborative science learning for participants who were not physically together. These and other types of collaborative simulations align with the Valtance simulation by allowing participants who are geographically separated to meet and collaborate.

Multi-user simulations can also occur offline. For example, Larkin and Maloney (2019) conducted a school finance simulation for pre-service and in-service school

[1] SimSchool: https://www.simschool.org/home/simschool/.
[2] Second Life©: https://secondlife.com/.

administrators. This simulation aligns with the Valtance simulation by applying a problem-based model in which participants go through briefing, action, and debriefing phases (Angelini, 2021). They used an instructional module for the briefing phase to introduce content about school funding. The action phase included a simulated district meeting in which participants talked to each other about funding and created a proposal to request state funding. The second step in the action phase was a state funding meeting with representatives from each district presenting their proposals. In the debriefing phase, participants reflected on the equities in school funding.

Ochoa and colleagues (2004) conducted a collaborative simulation that followed the same pattern. The briefing phase involved students completing a learning module to understand pre-referral and exploring their assigned roles (e.g., special educator, general educator, parent advocate, school psychologist, school administrator, and bilingual educator). Each participant received information aligned with the expertise of their role and created a goal for a hypothetical struggling learner. During the action phase, they met in a problem-solving team to choose and refine three goals. Participants reported that the simulation was a valuable learning experience and made course content more realistic.

14.3 Conclusions and Future Directions

Simulations can be an effective way to practice targeted skills in a safe, low-stakes environment. Some simulations use actors to play opposite pre-service teachers and other professionals while they are learning specific skills (e.g., TeachLivE^{TM} or Mursion). The actors are trained by experts to respond in particular ways based on what the participant says or does. Replacing the actor with a computer program (e.g., SimSchool) can also allow participants to practice skills, but there are limits to the way the program can respond. Finally, multi-user virtual environments (e.g., SecondLife) allow human-run characters to interact with each other in a virtual environment when participants cannot be physically in the same room.

The Valtance simulation takes lessons from the collaborative nature of simulations (e.g., Larkin & Maloney, 2019; Ochoa et al., 2004; Spencer et al., 2019). Similar to these simulations, participants went through a briefing step, an action step, and a debriefing step. They met one time to build rapport, but did not know each other as well as participants in the less successful role-play groups described in Spencer and colleagues' study (Spencer et al., 2019). Practicing collaborative discussions through simulations allows participants to co-construct new knowledge and build on previous, incomplete understandings of school decision-making. Future simulations might build on the literature that allows for pausing and repeated practice by structuring the collaborative meetings to include breaks for feedback and instruction (Dieker et al., 2014). More coaching and feedback might enhance the Valtance simulation to allow students to revise their statements and better occupy their assigned profiles.

References

Accardo, A., & Xin, J. (2017). Using technology-based simulations to promote teacher candidate parental collaboration and reflective instructional decision making. *Journal of Technology and Teacher Education, 25*(4), 475–494.

Angelini, M. L. (2021). *Learning through simulations: ideas for education practitioners*. Springer.

Bradley, E. G., & Kendall, B. (2014–2015). A review of computer simulations in teacher education. *Journal of Educational Technology Systems, 43*(1), 3–12. https://doi.org/10.2190/ET.43.1.b

Brownell, M. T., Benedict, A. E., Leko, M. M., Peyton, D., Pua, D., & Richards-Tutor, C. (2019). A continuum of pedagogies for preparing teachers to use high-leverage practices. *Remedial and Special Education, 40*(6), 338–355. https://doi.org/10.1177/0741932518824990

Darling-Hammond, L., & Bransford, J. (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do.* Jossey-Bass.

Dawson, M. R., & Lignugaris/Kraft, B. (2017). Meaningful practice: Generalizing foundation teaching skills from TLE TeachLivEtm to the classroom. *Teacher Education and Special Education, 40*(1), 26–50. https://doi.org/10.1177/0888406416664184

Dieker, L., Hynes, M., Hughes, C., & Smith, E. (2008). Implications of mixed reality and simulation technologies on special education and teacher preparation. *Focus on Exceptional Children, 40*(6), 1–20. https://doi.org/10.17161/foec.v40i6.6877

Dieker, L. A., Rodriguez, J. A., Lignugaris, K., & B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education, 37*(1), 21–33. https://doi.org/10.1177/0888406413512683

Dotger, B., & Ashby, C. (2010). Exposing conditional inclusive ideologies through simulated interactions. *Teacher Education and Special Education, 33*(2), 114–130. https://doi.org/10.1177/0888406409357541

Dotger, B. H., & Coughlin, A. (2018). Examining school leaders' simulated interactions in support of students with autism. *Journal of Special Education Leadership, 31*(1), 27–38.

Driver, M. K., Zimmer, K. E., & Murphy, K. M. (2018). Using mixed reality simulations to prepare preservice special educators for collaboration in inclusive settings. *Journal of Technology and Teacher Education, 26*(1), 57–77.

Fraser, D. W., Marder, T. J., de Bettencourt, L. U., Myers, L. A., Kalymon, K. M., & Harrell, R. M. (2020). Using a mixed-reality environment to train special educators working with students with autism spectrum disorder to implement discrete trial teaching. *Focus on Autism and Other Developmental Disabilities, 35*, 3–14. https://doi.org/10.1177/1088357619844696

Garland, K. V., Vasquez, E., III., & Pearl, C. (2012). Efficacy of individualized clinical coaching in a virtual reality classroom for increasing teachers' fidelity of implementation of discrete trial teaching. *Education and Training in Autism and Developmental Disabilities, 47*(4), 502–515.

Hartley, M. D., Ludlow, B. L., & Duff, M. C. (2015). Second Life(r): A 3D virtual immersive environment for teacher preparation courses in a distance education program. *Rural Special Education Quarterly, 34*(3), 21–25. https://doi.org/10.1177/875687051503400305

Hudson, M. E., Voytecki, K. S., Owens, T. L., & Zhang, G. (2019). Preservice teacher experiences implementing classroom management practices through mixed-reality simulations. *Rural Special Education Quarterly, 38*(2), 79–94. https://doi.org/10.1177/8756870519841421

Kolb, D. A., & Lewis, L. H. (1986). Facilitating experiential learning: Observations and reflections. In L. H. Lewis, (Ed.), *Experiential and simulation techniques for teaching adults: New directions for continuing education* (Vol. 30). Jossey-Bass.

Larkin, D. B., & Maloney, T. (2019). Teaching school finance to preservice teachers with a team-based simulation. *Teaching and Teacher Education, 85*, 1–12. https://doi.org/10.1016/j.tate.2019.06.001

Ludlow, B. (2015). Virtual reality: Emerging applications and future directions. *Rural Special Education Quarterly, 34*(3), 3–10. https://doi.org/10.1177/875687051503400302

Luke, S. E., & Vaughn, S. M. (2021). Embedding virtual simulation into a course to teach parent–teacher collaboration skills. *Intervention in School and Clinic*, 1–7. https://doi.org/10.1177/10534512211014873

McPherson, R., Tyler-Wood, T, McEnturff, A., & Peak, P. (2011). Using a computerized classroom simulation to prepare pre-service teachers. *Journal of Technology and Teacher Education, 19*(1), 93–110.

Murphy, D. M., Kauffman, J. M., & Strang, H. R. (1987). Using microcomputer simulation to teach classroom management skills to preservice teachers. *Behavioral Disorders, 13*(1), 20–34. https://doi.org/10.1177/019874298701300101

Nussli, N., Oh, K., & McCandless, K. (2014). Collaborative science learning in three- dimensional immersive virtual worlds: Pre-service teachers' experiences in second life. *Journal of Educational Multimedia and Hypermedia, 23*(3), 253–284.

Ochoa, T. A., Kelly, M. L., Stuart, S., & Rogers-Adkinson, D. (2004). The impact of PBL technology on the preparation of teachers of English language learners. *Journal of Special Education Technology, 19*(3), 35–45. https://doi.org/10.1177/016264340401900304

Parry, C., Pires, M., & Guber, H. S. (2008). Action review cycle and the after action review meeting. In P. Holman, T. Devane, \& S. Cady, and associates (Eds.), *The change handbook: The definitive resource on today's best methods for engaging whole systems* (2nd ed., pp. 73–90). Accessible Publishing Systems.

Robbins, S. H., Gilbert, K., Chumney, F., Green, K. B. (2019). The effects of immersive simulation on targeted collaboration skills among undergraduates in special education. *Teaching and Learning Inquiry, 7*(2), 168–185. https://doi.org/10.20343/teachlearninqu.7.2.11

Scorgie, K. (2010). A powerful glimpse from across the table: Reflections on a virtual parenting exercise. *International Journal of Inclusive Education, 14*(7), 697–708. https://doi.org/10.1080/13603111003778494

Spencer, S., Drescher, T., Sears, J., Scruggs, A., F., & Schreffler, J. (2019). Comparing the efficacy of virtual simulation to traditional classroom role-play. *Journal of Educational Computing Research, 57*(7), 1772–1785. https://doi.org/10.1177/0735633119855613

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Part III
Simulation and Virtual Exchange

Virtual Exchange to Enhance Simulation Practice Across Borders. Pilot Project

15

Rut Muñiz and M. Laura Angelini

Overview

As practitioners and researchers in virtual exchange (VE), our aim for the present chapter is to present an innovative pedagogical strategy that combines virtual exchange and simulation. As we all know, international higher education programmes are currently going through changes due to the global pandemic but even before that, there has been an increasing interest in connecting students across the world through virtual collaboration. Some of the VE virtues perceived by universities offer the opportunity to improve digital skills, intercultural awareness and communication, language competency, and other professional skills required for their future career. Telecollaboration, more recently coined "virtual exchange", which has long been presented in higher education, seems to have gained special interest from European universities and the European Commission. There is a mounting interest in training students in digital skills and intercultural communication through initiatives such as Erasmus + Virtual Exchange (Erasmus+Virtual Exchange: Impact Report (2018) Project: UNICollaboration and Virtual exchange (Report number: EC-02–19–388-ENNAffiliation: European Union) Francesca Helm & Bart van der Velden. 10.2797/668291) or The EVALUATE Group (Evaluate Group. (2019). Evaluating the impact of virtual exchange on initial teacher education: A European policy experiment. 10.14705/rpnet.2019.29.9782490057337), among others. These projects are gaining more visibility, probably due to the present sanitary crisis. There are many other organisations worldwide that foster VE such as the Stevens Initiative, a joint international effort to build global citizenship and professional

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skills for young people in the United States and the Middle East and North Africa by promoting virtual exchange (Stevens' Initiative, (2020). Virtual Exchange Typology). We will therefore define virtual exchange as a pedagogical approach and its main features will be identified.

Keywords

Virtual exchange · International communication · Cultural awareness · Simulation · Digital skills · Professional skills

Learning Objectives

By the end of this chapter, readers should be able to do the following:

- Differentiate virtual exchange from other forms of digital communication.
- Understand the virtual exchange potential for an internationalisation pedagogy.
- Comprehend the virtues of the methodological integration: virtual exchange and simulation.

15.1 What is Virtual Exchange (VE)?

VE refers to the engagement of groups of learners in online intercultural interactions and collaboration **projects** with partners from other cultural contexts or geographical locations as an **integrated part** of their educational programmes (O´ Dowd, 2018).

Over the past 20 years, VE has been used in different fields and contexts of university education such as foreign language education (EVALUATE1) and business studies (Osland et al, 2006; Duus & Cooray, 2014; Lindner, 2016) and has developed different models and approaches with very different learning objectives. The current situation in the context of COVID-19 has challenged the education system around the world and has obliged educators to adapt to an online mode of teaching unanticipatedly (De Benito et al., 2020; Gros & Durall, 2020). Many universities that were offering a face-to-face traditional pedagogical approach had no option but to adapt entirely to an online teaching-learning mode. Therefore, VE is acquiring a more relevant position as an alternative pedagogical strategy and as a form of inclusive mobility for students who are unable to participate in physical mobility programmes due to different reasons such as high costs of travelling and living in a foreign country or socio-economic, health-related, or political issues (Buchem et al., 2018). The intrinsic collaborative, experiential, and cross-curricular learning that VE offers becomes an ideal strategy to foster interaction between students and educators worldwide, as well as to promote the internationalisation of higher education not only in Europe but also among other continents.

15.2 Virtual Exchange: Pedagogical Approach to Enhance Simulation

One may ask why vindicating VE is a pedagogical approach. Well, we have observed that there has been a growing movement to consolidate the pedagogical foundations for this type of exchange and to establish VE as a solid teaching-learning strategy (Doodly & Masats, 2020; O'Dowd et al. 2019; Vinagre, 2017; Vinagre & Oscoz, 2020). As Doodly and Vinagre (2021) state, there are many publications, professional conferences, and dedicated foundations and digital platforms now available to the education community that refer to VE as an approach to teaching (Dooly & O'Dowd, 2018; Godwin-Jones, 2019). In addition, O'Dowd (2018) describes it as "pedagogically structured online collaborative learning initiatives" although he argues that over the past three decades, approaches to VE have evolved in different contexts and different areas of education in an isolated way.

Over the past 30 years, VE has been used in different fields and contexts of university education such as foreign language education (EVALUATE) and business studies (Osland, et al., 2006; Duus & Cooray, 2014; Lindner, 2016),and has developed different models and approaches with very different learning objectives. Thus O'Dowd (2017) classifies four approaches to virtual exchange in Higher Education:

a. Subject-specific Virtual Exchange (approach 1)—foreign language learning initiatives. This approach focuses on the foreign language education, that is, the exchanges proposed by foreign language educators between language learners in different countries to give them semi-authentic experiences. Examples of such approaches have been named in different ways such as e-tandem (O'Rourke, 2007), telecollaboration (Belz, 2003; Guth & Helm, 2010), or online intercultural exchange (O'Dowd & Lewis, 2016).
b. Subject-specific Virtual Exchange (approach 2)—This second approach has an important focus on the intercultural aspects of the language learning and has a greater integration of the online exchanges into classroom activity, study programmes, and the credit system (O'Dowd, 2013b; Hauck & MacKinnon, 2016). This approach of VE was referred to as "telecollaboration" (Belz, 2003) and includes many different tasks which enhance the intercultural skills of the working or professional environment (Belz, 2002; Belz, 2005; O'Dowd, 2005). Furthermore, a significant project, the INTENT project (O'Dowd, 2013b) financed by the European Commission, has been carried out to achieve a greater awareness of telecollaboration among the academic world and to foster the integration into university education. One of the main outcomes of this project was the development of the UNICollaboration platform[1] that fosters

[1] UNICollaboration platform: www.unicollaboration.eu.

partnerships between university educators and mobility coordinators, and it has also offered training for designing and implementing virtual exchange programmes.

c. Shared syllabus approaches to virtual exchange—This approach is based on the common work of a shared subject and develops a wide range of skills including intercultural competence and critical thinking at the same time providing the students with different cultural perspectives (Starke-Meyerring & Wilson, 2008). The main difference with the previous approaches is that this is not only used in the context of language learning because it includes many different fields and subjects and that a great emphasis is put on analysing different cultural and national experiences of subject content. There is an outstanding VE worth to be mentioned within this approach and that is the Collaborative Online International Learning (COIL). The COIL approach to UNICollaboration platform was developed by Rubin in 2004 and his colleagues at the State University of New York (SUNY) network of universities (Rubin et al., 2016). This model involves the collaboration between the teachers in two different universities which design course modules for their students to work together and engage in communication.
d. "Service-provider" approaches to VE—This approach involves different organisations which provide ready-made VE programmes for several educational levels such as primary, secondary, and higher education. The previous approaches included initiatives from independent teachers or educators; therefore, this is the main difference with the present approach. One of the best examples of this model is the Soliya Connect Programme which connects students from the West with students from the Muslim world where they discuss about socio-political issues and develop critical thinking, intercultural communication, and media literacy skills (Helm, 2016). There is another example of this "service-provider" approach and that is the Sharing Perspectives Foundation which is a non-profit organisation offering various programmes for collaboration including contemporary topics such as political science, law, economics, and social science.

VE nurtures interuniversity collaboration with an international dimension where students that might not have the chance for a physical international mobility are able to interact, work, and collaborate with students from different countries.

VE is flexible and can be designed for any subject area as we have seen. VE can even combine groups of students that study different degrees as we will learn from Chaps. 17 and 18 of the present book. It is not limited to just language teaching-learning; therefore, one of its most important values is that miscellaneous groups of students (diverse cultural backgrounds, different studies, etc.) can work on one VE project. This cross-cultural collaboration fosters professional skills development: digital, critical thinking, and intercultural communication skills, as mentioned above.

15.3 Who Can Facilitate Virtual Exchange?

It is always advisable to count on trained instructors-facilitators to design and implement VE. Several technical aspects should be considered. The facilitator should demonstrate

- the ability to use the chosen online medium to the extent where he/she can help others use the medium to communicate;
- the ability to multitask online and pay attention to technology, different communication methods, engagement, discussion content, time management, etc.;
- the ability to set up the online space for constructive engagement;
- the ability to read the non-verbal communication online;
- the ability to establish and maintain clarity and understanding in all channels of communication;
- the ability to support participants with technical challenges and normalise the experience for the group.

Facilitators should be able to create a conducive environment for learning. For this, he/she must guarantee safety, honesty, and representativeness during the process. Dialogue participants should feel safe enough with each other to speak up their minds and be able to express their feelings and opinions honestly, even when it is difficult. The facilitators' goal is to promote active listening to understand and engage, not to prove others wrong. Everyone should feel represented and heard. Any VE design must include clear learning objectives and follow a methodological approach. Several studies combine communication-based approaches with VE such as Task-based Language teaching (TBLT), Tasks-based Projects (TBP), Project-based Language Teaching (PBLT), Content and Language Integrated Learning (CLIL), and English as Medium of Instruction (EMI) (Doodly & Vinagre, 2021).

Going back to our starting point, why should we consider simulation for VE? The integration of simulation + VE offers a complete learning experience that aims at providing reasoned and theoretically based solutions to the educational problems posed by a simulation scenario. It is a collaboration with participants from other universities in an attempt to reach multicultural, communicative, and digital media skills. VE enhances simulation practice offering the possibility to be implemented in a virtual international environment beyond the class boundaries. The intrinsic collaborative, experiential, and cross-curricular learning that VE has proven to offer becomes an ideal tool to foster interaction between students and educators worldwide, as well as to promote the internationalisation of higher education not only in Europe but also among other continents and, therefore, in combination with the simulation methodology results in a highly educational approach.

We believe that the integration of simulation gives an added value to the whole virtual exchange experience. As you have read earlier in the different chapters, simulation refers to an activity in which participants are assigned duties and are

given enough key information about the problem to carry out these duties without play-acting or inventing key facts (Jones, 2013). Simulations are appropriate for addressing issues related to education, environmental threats, sustainable economy, business, law, or human rights. Through simulations, participants are involved in a reality in which they have to find solutions to certain problems or situations. They must do so by learning about the topic related to the scenario, proposing ideas, negotiating, and making decisions. Participants are exposed to reading material, audio-visual resources, and recent online news to familiarise themselves with the relevant topics (Crookall & Oxford, 1990; Duke, & Greenblat, 1981; Greenblat, 1988; Angelini & García-Carbonell, 2019).

15.4 Integration of Virtual Exchange and Simulation in Teacher Preparation

As we have observed so far, higher education programmes are increasingly moving to an online format. This may bring about a sense of lack of connection between students, instructors, or both. It has long been proved that students achieve better results and higher motivation when they have a sense of belonging in a learning community (Hartley et al., 2015).

During the course 2020–2021, at the university, we felt the need to bring together students from teaching degrees around the world to participate in a simulation through virtual exchanges. Times were difficult due to the sanitary crisis and pre-service teachers were hindered from doing their teaching practice in schools. It is in this context that we came up with the idea of integrating virtual exchange and the simulation "*The School of Valtance*"-Version 2, which can be consulted in Chap. 20. We attempted to create a sense of belonging, everyone pursuing a common goal with an added value, connecting pre-service teachers, academics, and in-service teachers from different cultural places, all discussing education (Angelini & Muñiz, 2021).

Participants: Mixed teams of 5–6 participants in each were made. Total number of teams [*N:16*] from Pädagogische Hochschule NÖ, Austria; Tunis Virtual University, Tunisia; University of Carthage, Tunisia; North-eastern Illinois University, U.S.A; Cégep de Jonquière, Canada; Universitatea Babes-Bolyai, Romania; Universidad Tecnológica Nacional, Argentina; the University of London, U.K; and Universidad Católica de Valencia, Spain.

Participants were mostly pre-service teachers, though a few in-service teachers and some academics also participated in the proposal. During the whole process (briefing-simulation-debriefing), academics were in charge of assuming the role of facilitators in their universities. They coordinated participants by contacting them, providing the material to be used (simulation scenario and profiles), and making a list of participants with detailed information (names and e-mail addresses). Their work as facilitators was central in the early stage of the simulation to guarantee high participation and adequate analysis of the educational challenges presented in the

scenario. Once the mixed teams were made, they were all coordinated by the leading university (Universidad Católica de Valencia) which provided two platforms for interactions. For synchronous sessions, TEAMS was used; for asynchronous sessions, LINKR Education was used.

The simulation lasted 6 weeks of which 2 weeks were devoted to the scenario analysis per country. 4 weeks were destined to the synchronous and asynchronous sessions. The last two days were devoted to the debriefing sessions and the digital questionnaire. Here we present some reflections after the debriefing session with the academics who participated.

Some reflections

We could identify strengths and weaknesses in our approach. To begin with, all the participants were assigned duties and given enough key information about the simulation scenario prior to their digital encounters. This reverted positively to thorough research on the part of the participants about each of the issues depicted in the scenario. In this way, we respected one of the basic premises of simulation: participants perform duties without play-acting or inventing key facts (Jones, 2013). They were committed to reflect on specialised literature and assume their role in the group with its objectives. They responded to the situations with their own judgment and knowledge as they would in real life.

> What I liked about simulation is that there's no single solution to the problems. There's research, discovery and collaborative work amongst its participants. (A1)

> The most enriching aspect has been the different backgrounds the participants had per team. I see that persistence is a quality the participants can develop through the simulation. Problems may seem difficult, and they have to study, do research and develop a broader understanding over some issues to be able to contribute with possible ideas leading to solutions. (A2)

Academics highlight the collaborative nature of the simulation in spite of being geographically separated. This is worth mentioning as we counted on technology to play its part in bringing professionals together and providing quality learning opportunities at a low cost. Another important aspect is the communicative nature of the simulation. Participants got acquainted with certain challenges and through dialogue could arrive at different solutions and proposals for improvement. It is relevant to mention that the role of the facilitators moderating the synchronous interventions was also key in making things run smoothly.

> The importance of guidance when using simulation is central for success. (A3)

However, it is the participants' inner drive and deep understanding of the situations that have a great impact on the simulation dynamics.

> A dynamic participant gives ideas other participants can draw on; interacts strategically and asks the right kind of questions. The dynamic participant knows the mechanism to stir the simulation. (A3)

The more the participants are used to doing simulations, the more insight they gain into their responses to

> it. As an academic reflected: "The clue is knowing when and when not interacting"—citing Klabbers' Magic Circle. In a good simulation exercise, everyone should feel represented and heard. The essential scaffolds for building a good discussion should be at stake: neutrality, good questions, and good observations (Belz, 2005; Baroni et al., 2019).
>
> The value of simulation relies on its collective nature. It fosters collective intelligence by opening to others, exchanging ideas and finding sound solutions. (A5)
>
> At first, I thought that by providing some solutions to the problems, the rest of participants would just accept them at once. I was quite the opposite. They questioned some of my ideas and had to do more reading and research. I felt challenged and realized they had good ideas. (A6)

Some flaws in the proposal may be in line with the representativeness of the scenario. Some academics pointed out that there may be some pre-service teachers whose intentions were to work only with adults, or in language academies. The scenario described educational challenges within a school context. We advise to adapt the scenario to meet participants' expectations if it is at all possible. However, most of the educational challenges collected in the scenario were easily transferred to other educational contexts.

Some adaptations to the pilot experience were also suggested, namely a longer briefing period to better prepare for the different problems found in the scenario. Some profiles were more difficult than others, for example, "the parent" role. Some suggested assigning this role to experienced participants (participants who were parents themselves or had sufficient teaching experience dealing with parents).

15.5 Summary

The integration of virtual exchange and simulation represented a structured educational experience that fostered mutual understanding over the educational issues depicted in the simulation scenario. It helped participants engage in constructive conversations and to highlight its value across cultures. With this proposal, we have aimed to prove that virtual exchange and simulation bring unique value to higher education.

With this project, we have also found a great potential to foster digital media literacy and intercultural communication skills to enhance language abilities and to broaden students' horizons without the need to travel in these times of pandemic.

References

Angelini, M. L., & García-Carbonell, A. (2019). Developing english speaking skills through simulation-based instruction. *Teaching English with Technology, 19*(2), 3–20. https://www.ceeol.com/search/article-detail?id=778015

Angelini, M. L., & Muñiz, R. (2021). Simulation through virtual exchange in teacher training. *Edutec Revista Electrónica De Tecnología Educativa, 75*, 65–89.

Baroni, A., Dooly, M., Garcıa, P. G., Guth, S., Hauck, M., Helm, F., & Rogaten, J. (2019). Evaluating the impact of virtual exchange on initial teacher education: A European policy experiment. Research-publishing.net. https://doi.org/10.14705/rpnet.2019.29.9782490057337

Belz, J. A. (2002). Social dimensions of telecollaborative foreign language study. *Language Learning and Technology, 6*(1), 60–81.

Belz, J. A. (2003). Linguistic perspectives on the development of intercultural competence in telecollaboration. *Language Learning and Technology, 7*(2), 68–117.

Belz, J. A. (2005). Intercultural questioning, discovery and tension in Internet- mediated language learning partnerships. *Language and Intercultural Communication, 5*(1), 3–39. https://doi.org/10.1080/14708470508668881

Buchem, I., Konert, J., Carlino, C., Casanova, G., Rajagopal, K., Firssova, O., & Andone, D., (2018). Designing a collaborative learning hub for virtual mobility skills–insights from the european project open virtual mobility. In P. Zaphiris & A. Ioannou (Eds.), *Learning and collaboration technologies. design, development and technological innovation, Lecture notes in computer science* (Vol. 10924, pp. 350–376). Springer International Publishing AG. ISBN 978–3–319–91742–9. https://doi.org/10.1007/978-3-319-91743-6_27

Crookall, D., & Oxford, R. L. (1990). *Simulation, gaming, and language learning*. Newbury House Publishers.

De Benito, B., García, J. M., & Moral, S. V. (2020). Entornos tecnológicos en el codiseño de itinerarios personalizados de aprendizaje en la enseñanza superior. *Edutec. Revista Electrónica De Tecnología Educativa*, (74), 73–93. https://doi.org/10.21556/edutec.2020.74.1843

Dooly, M., & O'Dowd, R. (2018). Telecollaboration in the foreign language classroom: A review of its origins and its application to language teaching practices. In M. Dooly & R. O'Dowd (Eds.), *In this together: Teachers' experiences with transnational, telecollaborative language learning projects* (pp. 11–34). Peter Lang.

Dooly, M., & Masats, D. (2020). 'What do you zinc about the project?': Examples of technology-enhanced project-based language learning. In G. Beckett & T. Slater (Eds.), *Global perspectives on project-based language learning, teaching, and assessment: Key approaches, technology tools, and frameworks* (pp. 126–145). Routledge.

Dooly, M., & Vinagre, M. (2021). Research into practice: Virtual exchange in language teaching and learning. *Language Teaching*, 1–15. https://doi.org/10.1017/S0261444821000069

Duke, R., & Greenblat, C. (1981). *Principles and practices of gaming simulation*. Sage.

Duus, R., & Cooray, M. (2014). Together we innovate: Cross-cultural teamwork through virtual platforms. *Journal of Marketing Education, 36*(3), 244–257. https://doi.org/10.1177/0273475314535783

Erasmus+Virtual Exchange: Impact Report (2018) Project: UNICollaboration and Virtual exchange (Report number: EC-02–19–388-EN-NAffiliation: European Union) Francesca Helm & Bart van der Velden. https://doi.org/10.2797/668291

Evaluate Group. (2019). Evaluating the impact of virtual exchange on initial teacher education: A European policy experiment. https://doi.org/10.14705/rpnet.2019.29.9782490057337

Godwin-Jones, R. (2019). Telecollaboration as an approach to developing intercultural communication competence. *Language Learning and Technology, 23*(3), 8–28. http://hdl.handle.net/10125/44691

Greenblat, C. (1988). *Designing games and simulations*. Sage Publications.
Gros, B., & Durall, E. (2020). Retos y oportunidades del diseño participativo en tecnología educativa. *Edutec. Revista Electrónica De Tecnología Educativa*, (74), 12–24. https://doi.org/10.21556/edutec.2020.74.1761
Guth, S., & Helm, F. (Eds.). (2010). *Telecollaboration 2.0: Language, literacies and intercultural learning in the 21st century (Vol. 1)*. Peter Lang.
Hartley, M. D., Ludlow, B. L., & Duff, M. C. (2015). Second Life®: A 3D virtual immersive environment for teacher preparation courses in a distance education program. *Rural Special Education Quarterly, 34*(3), 21–25.
Hauck, M., & MacKinnon, T. (2016). A new approach to assessing online intercultural exchange. *Online Intercultural Exchange: Policy, Pedagogy, Practice, 4*, 209.
Helm, F. (2016). Facilitated dialogue in online intercultural exchange. *Online Intercultural Exchange: Policy, Pedagogy, Practice*, 150–172.
Jones, K. (2013). *Simulations: A handbook for teachers and trainers*. Routledge.
Lindner, R. (2016). Developing communicative competence in global virtual teams: A multiliteracies approach to telecollaboration for students of business and economics. *CASALC Review, 1*(1), 144–156.
O'Dowd, R. (2005). Negotiating sociocultural and institutional contexts: The case of Spanish-American telecollaboration. *Language and Intercultural Communication, 5*(1), 40–56.
O'Dowd, R. (2013a). Telecollaboration and CALL. In M. Thomas, H. Reindeers, & M. Warschauer (Eds.), *Contemporary computer-assisted language learning* (pp. 123–141). Bloomsbury Academic.
O'Dowd, R. (2013b). INTENT project: Integrating telecollaborative networks into foreign language higher education. *The EUROCALL Review*, 21, (1).
O'Dowd, R., & Lewis, T. (Eds.). (2016). *Online intercultural exchange: Policy, pedagogy, practice.* Routledge.
O'Dowd, R. (2017). Virtual exchange and internationalising the classroom. *Training Language and Culture, 1*(4), 8–24. https://doi.org/10.29366/2017tlc.1.4.1
O'Dowd, R. (2018). From telecollaboration to virtual exchange: state-of-the-art and the role of UNICollaboration in moving forward. *Journal of Virtual Exchange*, 1, 1–23. Research-publishing.net. https://doi.org/10.14705/rpnet.2018.jve.1
O'Dowd, R., Sauro, S., & Spector-Cohen, E. (2019). The role of pedagogical mentoring in virtual exchange. *Tesol Quarterly, 54*(1), 146–172. https://doi.org/10.1002/tesq.543
O'Rourke, B. (2007). Models of telecollaboration: ETandem. *Languages for Intercultural Communication and Education, 15*, 41.
Osland, J. S., Bird, A., Osland, A., & Mendenhall, M. (2006). Developing global leadership capabilities and global mindset: A review. In G. Stahl (Ed.), *Handbook of research in international human resource management* (pp. 197–222). Edward Elgar Publishing.
Rubin, J., & Guth, S. (2016). Collaborative online international learning: An emerging format for internationalizing curricula. In A. Moore & S. Simon (Eds.), *Globally networked teaching in the humanities: Theories and practices* (pp. 15–27). Routledge.
Starke-Meyerring, D., & Wilson, M. (2008). *Learning environments for a globally networked world: Emerging visions. Designing globally networked learning environments: Visionary partnerships, policies, and pedagogies*. BRILL.
Stevens' Initiative. (2020).*Virtual Exchange Typology*. https://www.stevensinitiative.org/wp-content/uploads/2020/04/Stevens-Initiative-Virtual-Exchange-Typology.pdf
Vinagre, M. (2017). Developing teachers' telecollaborative competences in online experiential learning. *System, 64*, 34–45. https://doi.org/10.1016/j.system.2016.12.002
Vinagre, M., & Oskoz, A. (2020). Exploring attitude in bilingual virtual exchanges: A linguistic perspective. In *Understanding attitude in intercultural virtual communication* (pp. 64–91). Equinox.

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A Wider Perspective on Simulation and Virtual Exchange in Teacher Training: Developing a Holistic View of Practitioner Development

16

M. Laura Angelini and Rut Muñiz

Overview

Simulation and virtual exchange are one of the several proposals to provide professional development to future teachers. Based on our own research and empirical syntheses, this chapter reflects on the importance of emulating realistic school environments; understanding the importance of the briefing and the role of the facilitator in all the simulation phases; and conducting a reflective debriefing through constructive dialogue. In a way, we believe these reflections may challenge the many policy-makers who may conceive teacher education as a closed experience of professional formation, rather than as the starting point for global collaborative and lifelong learning, something that should characterise a teacher's career in the twenty-first century.

Keywords

Simulation · Virtual exchange · Teaching degree · Professional development · Lifelong learning · Dialogic learning

Learning Objectives

By reading the chapter, educators and practitioners will be able to.

- gain deep insights into school realities regarding methodological issues and the educational community;

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- find a reinvigorated teacher training proposal through the integration of virtual exchange and simulation;
- reflect on the importance of a well-constructed briefing;
- learn facilitation tips to carry out simulation;
- learn the importance of debriefing.

16.1 Why Simulation + Virtual Exchange in Emulating School Environments in Teacher Preparation?

As we have seen earlier in this book, simulation results in an appropriate methodological choice for some teacher trainers. Many of its virtues have been identified and discussed, such as the opportunities to act as if in a real educational situation. The possibility to have glimpses of what actually happens in a school through well-designed scenarios that portray school realities that may improve the preparation of teachers. We propose that a simulation fosters more research into specific topics in order to solve certain problems or better go about specific challenges. Teacher training programmes are reinvigorated by simulation offering "low-risk" environments in which research, dialogic learning, and cognitive and metacognitive skills are developed (Fearon et al., 2012; Mikeska & Howell, 2020). See the discussion on the inappropriateness of the term "low risk" in Crookall and Thorngate (2009). It is not so much the level of risk that makes a difference but the severity of the impact in a simulated reality.

However, you may wonder what virtual exchange has to do within the process. Virtual exchange refers to the engagement of groups of participants in online intercultural interactions and collaboration projects with partners from other cultural contexts or geographical locations as an integrated part of their educational programmes (O'Dowd, 2018). In this sense, our proposal of integrating simulation and virtual exchange relies on the belief that today teachers should think outside the box. Teachers should be acquainted with what other institutions are implementing, what type of training other teachers are getting, what challenges other schools are facing, and how they go about them. By working collaboratively with teacher trainers from abroad, we have been able to find commonalities in some educational-related challenges. This initial contact and exchange with academics have led to the creation of a simulation scenario that comprises most of the relevant issues worth discussing.

In this regard, the creation of the simulation scenario is a collaborative act in itself, inclusive of educational realities that need to be further investigated. This international collaborative nature of the scenario proposal leads to virtual exchanges among teachers, pre-service teachers, and academics from several faculties of education. Topic-oriented discussions are fostered with a common thread: education.

Several works such as Fanning and Gaba (2007), Lameras and colleagues (2012), and Cochran-Smith and Villegas (2015), and more recently Frei-Landau & Levin (2022), have greatly contributed to elucidate the benefits of the proposal. Finding common challenges in pre-service teachers' professional careers and exchanging viewpoints on the most adequate measures to deal with them can be easily appreciated. The intercultural component can also be highlighted, especially in times of massive upgrades in telematics (Cheng et al., 2015; Helm, 2016, 2018). This intercultural perspective gains even more importance due to the growth of more multicultural classrooms. It seems imperative that we teachers, pre-service teachers, and academics work on developing a global mindset to approach this reality. In this sense, the virtual exchange serves as a very convenient strategy.

16.2 How is Research Entwined Around Simulation?

Another important aspect to analyse is the importance of research in the simulation and how it is enriched by the contributions of the different participants through the virtual exchanges. Past research on teacher education was described in terms of the curriculum and the effectiveness of some methodological approaches (Cochran-Smith & Villegas, 2015). Complementing the study conducted by Cochran-Smith and Villegas (2015), the present research through the integration of simulation and virtual exchange in teacher preparation relies on two main issues: school policy and learning reinforcement.

Thus, in order to delve into the school context and its challenges, our simulation briefing offers plenty of possibilities. In light of the scenario, the preparation or briefing phase becomes a fertile ground for research. Participants will require time and guidance to familiarise themselves with the different issues presented in the scenario to become more autonomous in their search for solutions and alternatives. They are expected to question the studies published and the literature they read and come up with solid ideas that truly result in a more optimal framework for action in the simulated reality. The simulation methodology, therefore, fosters the acquisition of specialised knowledge while allowing access to information from a variety of sources.

From a research perspective, simulation scenarios are inspired by reality, and the participants must have a broad knowledge of the scenario. Probably one of the most remarkable strategies when it comes to preparing the briefing phase is to omit the profiles' description until the very end. That is, participants become familiar with the scenario and know the kind of profiles who will intervene. Then, they will analyse the scenario and its challenges from the different profiles' perspectives. Analysing the problems from multiple perspectives has proven to enrich the research process (Angelini & Muñiz, 2021). Only then, after approaching the scenario from different angles, each participant receives their profile role. A well-designed briefing will require sufficient time for the participants to do research and discuss their findings. Reliable, evidence-based sources of information

and active participation and commitment of all members are central to a productive simulation action. So, rigorous preparation from the initial phase of a simulation can be one possible solution for teachers to provide practice-based environments where novice teachers can approximate argumentation-focused discussions.

16.3 The Importance of Facilitation

The type of dialogue and learning VE aims to achieve does not happen on its own. For dialogue to progress, safe and productive facilitators have a key role to play. Facilitating a VE and a simulation have many aspects in common. In this section, we will describe the characteristics of the facilitator's role in both types of experiences and describe how they converge.

- **VE facilitation**

Placing participants who are scattered around the globe in virtual exchanges requires specific mastery on the part of facilitators. It is important to prepare the participants for the communicative exchanges through a thorough training during the simulation briefing. Participants must learn notions about active listening, neutrality and multipartiality (Soliya, 2010), representativity and multiculturality, and language restraints, among other skills. Figure 16.1 gathers the key elements of facilitating VE.

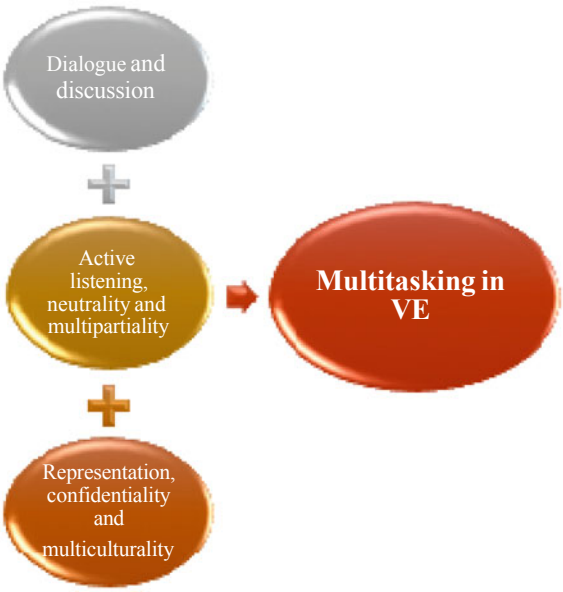

Fig. 16.1 Multitasking in VE facilitation

According to Helm (2018), the facilitators in VE involve multitasking skills to work as hosts, implementers, orchestrators of interaction, summarisers and probers, and reflexive practitioners. As defined in the Virtual Exchange typology:

> A facilitator is a person who plays a present role in enabling constructive engagement among virtual exchange participants. Facilitators are sometimes, but not necessarily, educators. The role of facilitation puts greater emphasis on empowering participants to take an active role in shaping the experience and it is distinct from teaching or lecturing. (Stevens Initiative, 2020).

Below, we provide the reader with some tips when facilitating a simulation through virtual exchange. Facilitators should train the teams in active listening. This kind of active listening can bridge gaps between people but requires patience, attentiveness, and responsiveness (Schultz, 2003). It is vital for dialogue to make everyone feel heard and comfortable to share and deepen the dialogue. When participating in a VE, there are certain challenges to consider such as the following:

- **External challenges**: They can relate to technology (Internet connection, platform, and equipment), maintaining concentration with so many distractions available online, or because of different languages and accents present in the dialogue.
- **Internal challenges**: They can relate to each participant's own state of listening and thought processes in the dialogue.

Another important aspect is to prepare participants to function as a cross-cultural group and take ownership of the dialogue. Representativeness helps participants feel heard and respected, both by the group and the facilitator (Leigh et al., 2021). Facilitators of simulation through virtual exchange should emphasise the principles of neutrality and multipartiality. In line with the exercise of active listening, neutrality helps to avoid biases. Participants must be aware that body language, tone of voice, or word choice may reveal personal positions towards a topic. Multipartiality, in turn, entails giving more attention to those they agree with and asking them more questions. It is important that facilitators train simulation participants to manage these biases; otherwise, participants may just hear others' contributions through the lens of their own responses instead of listening to their messages. Simulation and virtual exchange encounters need time. It is important to plan sufficient synchronous and asynchronous sessions in order to build trusting relationships as a means of encouraging participation (Leigh et al., 2021). A policy of confidentiality is also recommended. Facilitators should also train participants to set group rules so that everyone knows what is and is not allowed in their discussions and commits to those rules.

Finally, facilitators should indicate to the participants to appoint a "leader" or "secretary" or any other profile role with the responsibility of summarising and observing (Helm, 2016; Grund & Schelkle, 2020). The aim is to gain greater clarity and perspective in the communication. Summaries can include stating the main comments, who said what in the discussion; stating the main points or themes of the

discussion; and commenting on the debate and its dynamics (e.g., "there were divergent views on… or agreement on…").

It is also important to encourage positive comments on participation (e.g., "Thanks for the great conversation! There was very active participation today") and find ways to move the discussion forward (e.g., follow-up questions or topics for future discussion). This is also applicable to the debriefing session when the facilitator is in charge of leading and drawing reflections on the experience (Capogna et al., 2020; Crookall, 2010; Helm, 2016, 2018).

To summarise, remember to take notes. The conversation tends to move very quickly, and it is very difficult to make an accurate summary without taking notes. The chat box can be wisely used for this purpose so that everyone can read comments in real time. When quoting, it is advisable to do it directly, especially for controversial points. Make sure participants understand how to paraphrase accurately and use people's names. "Peter said…". (The danger of simply summarising controversial points is that there is a chance that some members of the group may think personal opinions are expressed, instead).

It is likewise important to avoid editorialising. It can be difficult, when summarising, not to highlight only the points you agree with. So, participants should try to keep their language as neutral as possible.

16.4 Summary

These tips provided will improve simulations in which agreement is sought through constructive dialogue. It is true that some simulations, especially in areas such as law or business, may require a fiercer discussion. Depending on the goals pursued, the dialectical and discourse strategies will vary. It is also true that there can be a discussion and not a dialogue, but there cannot be a dialogue without the presence of a good discussion (Soliya, 2010). Promoting good discussion takes time. The group needs trust to know that they will be listened to and to get to a certain stage of the group process that simply cannot happen directly from the start.

The intercultural communication fostered by the simulation through VE thus offers pre-service teachers opportunities for intercultural learning and engaging with difference, which can also lead to self-discovery. This is where the role of a facilitator is critical.

To conclude, for dialogue to progress and remain constructive and conducive to learning, facilitators have a crucial role to play. Even more so when people meet online, where the building of trust and authenticity as they connect with each other needs to be facilitated with care, keeping in mind the challenges of an online engagement. Dialogue is then an interactive learning process: everyone contributes to dialogue—and the learning—and all voices are important. Therefore, a safe environment where participants are comfortable sharing and trust each other needs to be built for the learning to progress. In all, these aspects are to be considered to develop a holistic view of the facilitators' job throughout the whole experience.

References

Angelini, M. L., & Muñiz, R. (2021). Simulation through virtual exchange in teacher training. *Edutec Revista Electrónica De Tecnología Educativa, 75*, 65–89.

Capogna, G., Capogna, E., & Nardone, G. (2020). The strategic debriefing. Incorporating strategic dialogue in the standard debriefing after the scenario. *MedEdPublish*, *9*.

Cheng, A., Grant, V., Dieckmann, P., Arora, S., Robinson, T., & Eppich, W. (2015). Faculty development for simulation programs: Five issues for the future of debriefing training. *Simulation in Healthcare, 10*(4), 217–222.

Cochran-Smith, M., & Villegas, A. (2015). Studying teacher preparation: The questions that drive research. *European Educational Research Journal, 14*(5), 379–394.

Crookall, D. (2010). Serious games, debriefing, and simulation/gaming as a discipline. *Simulation and Gaming, 41*(6), 898–920.

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation- based learning. *Simulation in Healthcare*, *2*(2), 115–125.

Fearon, C., McLaughlin, H., & Eng, T. Y. (2012). Using student group work in higher education to emulate professional communities of practice. *Education + Training*, *54*(2–3), 114–125.

Frei-Landau, R., & Levin, O. (2022). The virtual Sim (HU) lation model: Conceptualization and implementation in the context of distant learning in teacher education. *Teaching and Teacher Education*, *117*, 103798.

Grund, C. K., & Schelkle, M. (2020). Developing serious games with integrated debriefing. *Business and Information Systems Engineering*, *62*(2), 87–101.

Helm, F. (2016). Facilitated dialogue in online intercultural exchange. *Online intercultural exchange* (pp. 164–186). Routledge.

Helm, F. (2018). *Emerging identities in virtual exchange*. Research-Publishing.Net.

Lameras, P., Levy, P., Paraskakis, I., & Webber, S. (2012). Blended university teaching using virtual learning environments: Conceptions and approaches. *Instructional Science, 40*(1), 141–157.

Leigh, E., Tipton, E., Likhacheva, E., de Wijse-van Heeswijk, M., & Zürn, B. (2021). Why Facilitation? *Simulation and Gaming*, *52*(3) 247–254.

Mikeska, J. N., & Howell, H. (2020). Simulations as practice-based spaces to support elementary teachers in learning how to facilitate argumentation-focused science discussions. *Journal of Research in Science Teaching, 57*(9), 1356–1399.

O'Dowd, R. (2018). From telecollaboration to virtual exchange: State-of- the-art and the role of UNICollaboration in moving forward. *Research-Publishing.net, 1*, 1–23.

Schultz, K. (2003). *Listening: A framework for teaching across differences*. Teachers College Press.

Stevens Initiative. (2020). *Virtual Exchange Typology*. The Aspen Institute. https://www.stevensinitiative.org/resource/virtual-exchange-typology/

Soliya. (2010). *Connect program facilitation training guide. Fall 2010*. Unpublished training manual.

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Combining Simulation and Virtual Exchange in Legal Education

17

Pilar M. Estellés and Rut Muñiz

Overview

The situation generated by COVID-19 meant a generalized confinement of the Spanish and world population and a serious brake on the international mobility of university students and professors. All this brought with it a new way of learning for university students and new opportunities for improvement and teaching evaluation, through the use of new technologies which facilitated the virtual exchange (VE) of students and law professors. In this chapter, we present the pilot experience of a virtual exchange between students of the Catholic University of Valencia "San Vicente Mártir" (Spain) and the Libera Università Maria SS. Assunta, LUMSA (Italy), within the framework of the Law degree. This experience offers the possibility of acquiring the competences that a Law graduate needs to be prepared to adapt to what the constantly changing society requires of them for the solution of complex problems. In addition, we would like to propose how active methodologies and specifically how simulations in combination with the virtual exchange can improve the learning of future law professionals.

Keywords

Legal education · Law degree · Simulation · Virtual exchange · Active methodologies

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Learning Objectives

By the end of this chapter, readers should be able to understand how:

- the paradigm shift in the Law teaching and learning process has taken place;
- virtual exchange improves the teaching–learning process in the legal subjects and prepares future professionals to work in the global context;
- the use of simulation + virtual exchange for training future lawyers is an innovative approach in the Law Higher Education.

17.1 The Paradigm Shift in the Teaching–Learning Process

The traditional teaching methods of Law established the focus of learning on the professor, relegating the student to the role of a passive learner in the process who did not assume responsibility for his own learning. The European Higher Education brought about a revolution in these approaches that entailed a process of methodological renewal for the teacher based on student-centered learning, emphasizing the focus on the learner. Student-centered teaching methods include active learning, in which students must solve problems, answer questions, formulate their own questions, discuss, explain, debate, or brainstorm. Taking this into account, a new approach to learning requires an active and participatory attitude from the student in the classroom. Therefore, the teacher must take a back seat while implementing mechanisms of direction, control, and supervision of the proposed learning activities.

Consequently, student-centered teaching includes training in significant skills, such as learning to think, developing critical thinking after the study and analysis of a case from various possible approaches or solutions, or solving problems taking into account the real or simulated dynamics proposed; learning to make decisions in a short period of time and to work as a team in a collaborative and participatory manner, involving the team to adopt a solution to the problem posed; evaluating the interventions of other colleagues or disagreeing with them by arguing their positions, analyzing their own and others' arguments and refuting them; and generating hypotheses and theses in the development of practical sessions. In short, the student will develop a series of skills and competencies essential for learning the subject matter of the course (Estellés, 2021). In relation to this methodological change, we should mention that Anglo-Saxon universities have a long history in the use of active methodologies in the field of law education such as the case method initiated by Harvard University more than five decades ago, the simulation of trials or moot courts, which were first introduced as an educational tool in the fourteenth century in the United Kingdom (Dickerson, 2000); legal clinics, university parliaments, simulation combined with the inverted classroom, role playing, simulation (Phillips,

2012; Maharg & Nicol, 2014), etc. However, in Spain, some of these methodologies have been scarcely applied, especially in the case of simulation. Learning law involves a vast study of theoretical concepts that students will have to put into practice in their future professional lives, and for this reason, we must try to combine theoretical learning with experiential learning through active methodologies such as simulation.

In addition to all this, we must add that in the context of globalization, today's students require international experiences within their own learning, since in their professional future they will have to work with people from very diverse cultural backgrounds and most likely in multicultural work teams, which is why virtual exchange offers the possibility of acquiring competencies that will allow them to work in an international and intercultural environment in the future.

In the current context of the pandemic, events are happening unexpectedly, producing drastic changes in our usual way of life and teaching. These processes of change require a response from university education in accordance with the current times that force the university and teachers to creatively apply new technologies that are now indispensable in the next stage that we face as teachers in general, and university professors in particular.

Numerous previous studies have shown that student attendance in the classroom, their physical presence in the teaching sessions, can result in improved evaluation results of university students (Garrido, 2010; López, 1982; Pérez & Graell, 2004; Rodriguez & Herrera, 2009). However, according to Galindo (2020), after a decade of the introduction of the European Higher Education and the changes in teaching methodology that this entailed, such as involving the student and making him the facilitator of his own learning, legal coursework can be boring or excessively theoretical and this causes disinterest and absenteeism. One of the criticisms frequently made by students is that the university provides them with a lot of theoretical knowledge but does not prepare them for the situations they will encounter in their professional careers. During the teaching–learning process, the methodology is crucial to achieve the desired objectives for active learning, so simulation can be a stimulus for students and a motivation for the learning process.

We can find authors that conduct research on simulation as an innovative active methodology for the teaching–learning process in legal science degrees in Spain (García, 2018; Galindo, 2020) and also abroad (Phillips, 2012; Maharg & Nicol 2014; Daly & Higgins, 2011). Likewise, the necessary international exchange of students and teachers, so enriching legally, linguistically, and culturally, had been cut off by the health situation caused by this historical pandemic. With this possibility closed and/or limited, we valued the opportunity to take advantage of digital media and student exchange expectations to propose new formulas for international collaborative learning in order to take advantage of the weaknesses of the situation (pandemic and restriction of national and international mobility, isolation at home) and turn them into strengths and opportunities for improvement and learning (international socialization and exchange of ideas, cultures, and legal and social points of view), all promoted by European Higher Education.

The objective of our virtual exchange was to minimize the adverse consequences of the impact of a majority or exclusively online teaching and student attendance through virtual platforms and the impediment of traveling to other countries and collaborating with other universities. The challenge has been significant. The professors participating in this activity were required to foster in their students the competencies demanded by society in such circumstances with the academic competences of the subject itself, an autonomous and responsible learning in a stressful environment, a resolution of the problem, critical reflection, an ethical commitment to society, development of language skills, and collaborative teamwork with the use of digital technologies. The aim of all of these is to promote student learning, and introspective assimilation of academic knowledge through other methods that also provide an improvement of other skills and abilities necessary for their training and professional projection as a graduate.

To this end, it was proposed to the students the free and voluntary participation in the virtual exchange pilot project in order to improve and minimize the repercussions of the pandemic and its restrictions on in-person learning in legal subjects such as Civil Law.

17.2 Virtual Exchange in the Teaching of Law

The teaching/learning developed through the formula of virtual exchange has proved to be an optimal tool to promote cooperation and internationalization of learning between students and teachers and the university community from different national and foreign universities. The advantages of incorporating virtual exchange into the university experience include the internationalization of learning and capacity building. In this sense, VE is an innovative educational tool that offers faculty the opportunity to broaden their classroom teaching and help students develop and improve their intercultural skills and digital competencies. Moreover, it is an ideal tool for internationalization "at home" of legal subjects. Participants can have an international experience from the classroom, breaking down the economic and health barriers (the latter caused by the COVID-19 pandemic) that come with visits to other countries. Another advantage of the virtual exchange is the links that are generated between the different participating universities and the resulting projects, collaborations, and joint initiatives on civil law issues, especially and particularly centering on the problems arising from family crises.

Through participation in the virtual exchange, the law professors and students have been able to experience a multicultural experience in the legal classroom, and a valuable collaboration has been fostered between international students and professors, in this particular case from LUMSA University (Italy) and UCV (Spain). This has allowed the development of new techniques of learning and teaching of law, the practice of communicative skills using other languages, including Spanish, Italian, and English, all of which has facilitated the development of skills and abilities in multicultural environments at the social and legal level that

provides a broadened worldview of the problems of civil law under analysis. The practical realization of this telecollaboration project has also meant the digital improvement of the participating university community and a close intercultural and legal collaboration for the analysis and comparative legal and jurisprudential study of problems and solutions of family law and law derived from the State of Alarm generated by the COVID-19.

17.3 Innovation in the Teaching–Learning Processes and the Development of Competencies within a Legal Subject

In the last decade, law students have been struggling with attention and concentration, organization and time management, and logically structured reasoning; they are not accustomed to effective work techniques that will help them learn from their classes, such as working daily in the disciplines they study, persevering in their efforts, taking responsibility, working collaboratively, and managing adversity (Estellés, 2021). Faced with these factors that hinder learning and the limitations caused by the pandemic, we have tried to encourage intellectual curiosity, critical thinking, and oral and written expression necessary for future lawyers and legal professionals through a university exchange (virtual) in order to promote students use of analytical techniques and comparative skills between different societies and laws, complemented by the use (so essential today) of new technologies.

Through VE, participating students promote the development of general and specific competences of the subject they are taking:

(a) General skills: analysis and synthesis skills; organization and planning skills; problem-solving skills; critical reasoning in the analysis of information; oral and written communication skills in the native language in relation to the Science of Law; ability to establish and maintain relationships with other professionals and relevant institutions; information management skills.
(b) Specific skills: ability to make legal arguments; development of legal oratory; ability to express oneself appropriately before an audience; assumption of the necessary interdisciplinary vision of legal problems; ability to work in interdisciplinary teams and collaborate effectively with others; ability to negotiate and conciliate; and ability to articulate projects, agreements, and disagreements in legal terms.

In short, we have tried to promote abilities, skills, and competencies such as self-learning, autonomous and collaborative work, effective communication, public speaking, and critical analysis of law.

17.3.1 E-Learning Through Collaborative Teamwork

In relation to collaborative work, we want to highlight its importance both in learning and in the practice of law because the distribution of complementary functions among the different components of the team is crucial to a high-quality result. This virtual exchange also offers the possibility for the student to learn about the different roles that can be played in collaborative work. We believe that we have successfully achieved this objective.

17.3.2 E-Learning and the Development of Critical Thinking in Higher Education

The promotion of critical thinking as an educational innovation pursues the promotion of a determined, deliberate, and self-controlled intellectual process that seeks to reach a reasonable judgment in legal matters. Also, it offers reasonable and equitable solutions in the light of current legislation, evaluating the pros and cons of the different formulas for resolving legal conflicts in the family environment. If this is added to the comparative vision of different legal systems and points of view, the results are very satisfactory for their personal and formative development.

The objectives and aims of this project are oriented toward the critical analysis of the law and the search for the best solution that adequately protects the interests of the parties involved in the problems raised. Thus, one of the topics proposed is related to the limitations to the exercise of parental authority and responsibility for minor children and their legal and jurisprudential treatment in Spain and Italy (comparative view and critical analysis).

To this end, a comparative study of the Spanish and Italian legislation and jurisprudence was carried out in order to analyze whether the different legal regulations and jurisprudential pronouncements of the different countries involved in the analysis grant the same or different legal treatment. In the event of differences, it was necessary to determine whether these were substantial and in what way they improved the protection provided by the corresponding civil legal system.

17.3.3 Virtual Learning of Consensus Solutions

Another purpose of this exchange is to create an environment that can demonstrate to students that even in situations of communication problems and controversial ideas and opinions, consensual agreements must be reached. They must learn to communicate and reach agreements in an appropriate manner despite linguistic, cultural, and legal differences. The analysis was also carried out in the two native languages of the students involved (Spanish and Italian) and developed as a single collaborative teamwork between the Italian and Spanish students.

17.3.4 The Implementation of VE in Civil Law Courses

In the Civil Law courses where this proposal has been offered, the VE has been developed with the aim of facilitating learning experiences, both for students and teachers. Another objective was to have an intercultural online collaborative learning of different legal problems in order to analyze how they are resolved at the legislative and jurisprudential levels in the different legal systems compared. Therefore, to draw conclusions on how to implement and improve problems that are of outstanding importance and seriousness in the field of Family Law.

Likewise, the VE is intended to develop linguistic, intercultural, and digital skills in order to develop a coherent approach to learning, which not only transcends and unifies the analysis and understanding of the different areas of Family Law, but also stimulates the appreciation and learning of other legal perspectives which are necessary for students' professional futures.

The added value offered by the VE in Family Law is that the student can improve the understanding of problems related to the family environment, the natural place where the child develops, is educated, and is protected. It is also a field of conflict when the family unit breaks down and new situations arise that affect the children in various important aspects related to the exercise of parental authority and the responsibility of minor children (major minors), as well as the legal and jurisprudential treatment of child support for dependent adult children, and to analyze and discuss how these same problems are resolved in other related legislations. Through the VE, teams of students develop a joint telecollaborative project in relation to the subjects assigned to each team, in particular the topics that are directly related to the problems that affect children dealing with family crises and analyze them in the light of the legal regulations and the jurisprudential solutions of the courts in Spain and Italy.

The VE took place within the scope of the subjects *Sistemi Giuridice Comparati* (Comparative Legal Systems) taught by Prof. Gabriele Carapezza Figlia (LUMSA) and *Derecho Civil IV. Derecho de Familia* (Civil Law IV. Family Law) taught by Prof. Pilar María Estellés Peralta (UCV).

The exchange was organized in 6 sessions, distributed over 3 months, which lasted approximately 12 h, with an introductory session and a closing session. The rest of the sessions correspond to the meetings of the interuniversity work teams. Attendance to all online synchronous sessions was absolutely mandatory. Likewise, students were required to attend all the meetings for their work teams.

For this pilot project, it was decided that student enrollment in the VE was voluntary and generated a commitment of completion to avoid prejudice to their training groups. Students enrolled in any of the classes of both LUMSA and UCV participating in the exchange could participate. Around 30% of the students enrolled in the courses initially applied to participate in the virtual exchange. Applicants were selected based on objective criteria of merit and academic ability (academic record, level of active participation in previous subject sessions, etc.). The selected students agreed to participate with responsibility, punctuality, and diligence in the tasks. In addition, the languages used by the participating students

for team meetings, coordination, preparation, and analysis of the subject matter and writing of the final proposal could be Spanish, Italian, and English; however, the final proposal had to be written in Spanish and Italian. The oral presentation of the proposal combined both languages, unless the students opted for English, in which case both the proposal and the final presentation were in English.

The learning process was developed online and in synchronous mode through the TEAMS educational platform. The participation of the students in this learning process was carried out through collaborative teamwork. The teams were formed by the teachers coordinating the exchange among the participating students, trying to keep a mixed proportion between students from LUMSA and UCV, taking into account the distribution of students, both the number of students from each university and the gender of all of them in each of the groups. Once the work teams had been assigned, no changes were accepted during the exchange.

With regard to the organization of the work, we can highlight four phases (Fig. 17.1):

- Phase I: The teachers of the subjects involved structured and organized the virtual exchange.
- Phase II: In this phase, information was provided and calls for applications were made for interested students.
- Phase III: In this phase and during several weeks, several virtual synchronous meetings were held between the participating students and the teachers promoting the activity. Some were virtual work meetings of the teams in order to share the different regulations and legal solutions of each country and to analyze

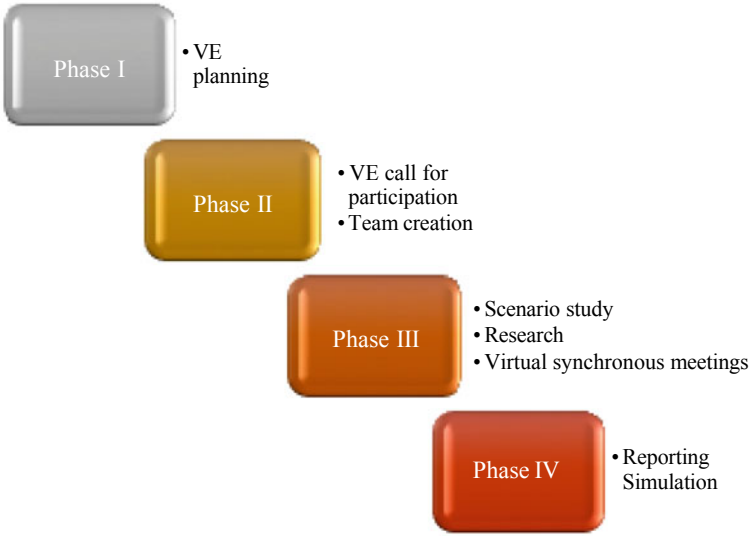

Fig. 17.1 Procedure followed

issues through each legal. After these meetings, a comparative analysis was conducted and the advantages and disadvantages of the different legal systems and the respective jurisprudential pronouncements were analyzed and joint solutions were proposed that highlighted the most relevant and enriching aspects of the different normative solutions. Students had to coordinate and collaborate, so activities developed by only one or several members were not allowed. During the exchange, whole group sessions were combined with the independent and autonomous work sessions of each team.

- Phase IV: In this last phase, which remained completely virtual, the teams had to make an oral and public presentation of their conclusions to the participating teachers and the students of the other teams.

The exchange has counted on the accompaniment and permanent tutoring of Prof. Dr. Pilar María Estellés Peralta and Dr. Gabriele Carapezza Figlia. Therefore, the working teams received concurrent guidance and feedback on the progress of their tasks, so that they could improve them and move forward for each session.

The evaluation of the work presented through the virtual exchange included the acquisition and/or improvement of the skills, abilities, and competences acquired during the exchange. The results of the exchange were the proposals presented by the teams, the soundness of the arguments, the consensus among the participants, the legal arguments of the dissenting team members of the overall solutions, and the oral presentations (through synchronous virtual meetings via Teams).

17.4 Some Reflections

In conclusion, the students acquired and strengthened their knowledge of basic and relevant aspects of Family Law through the analysis and resolution of cases in discussion with peers with different perspectives.

The students valued the VE project as a highly positive learning experience and very useful in their future profession as it prepared them as future jurists who can propose ideas for contracting and resolving legal conflicts. The participating students said that the VE contributed to the development of their digital and intercultural skills as well as their collaborative and multilingual skills. The following are some of the students' final comments regarding the VE experience:

> Thank you very much to everyone for this wonderful opportunity from which we have learned from each other (S1).

> Thank you very much to everyone and especially to the teachers for letting us participate in this experience which has been great and very enriching! It has been a pleasure (S2).

The use of technology proved to be an interesting tool for teaching innovation and learning, taking into account the predisposition of the students toward the use of technology, which was a determining factor in creating an ideal context for innovation through the virtual exchange.

Moreover, they had an excellent understanding of what it means to work in multidisciplinary, international, and intercultural legal teams, with diverse and enriching legal systems and approaches to the science of law.

Regarding the advantages from the teaching point of view, for the participating professors, the virtual exchange had a positive impact on their teaching approach, allowing them to innovate in their classes and improve their own teaching methods. They also improved their collaborative links with fellow teachers at the international level, both in teaching and research.

The greatest challenges encountered by the professors during their exchanges were related to time management, as they had to arbitrate and allocate time outside of teaching hours for virtual meetings with students from both institutions and for the work meetings of the different teams. Likewise, they had to coordinate with each other for the implementation and development of the exchange and the evaluation of the results. Regarding the technological infrastructures of their respective educational institutions, they were very satisfied with the high technological level of their universities. However, the lack of institutional recognition of the added work that this activity entails was noted.

17.5 VE+ SIM Future Proposals for Training Future Lawyers

After the experience of the virtual exchange project that we have implemented among our students, we believe that going one step further would be to combine it with a simulation. Since the simulation is designed with the purpose of challenging law students to step out of their comfort zone, the combination of virtual exchange and simulation encourages deep learning, students to be responsible for their own learning and developing their research and critical thinking skills. Through these methodologies, students stop being passive and become active, leaving behind a purely theoretical model of law teaching.

It prepares them in a practical and complete way for the professional world by acquiring communication, negotiation, empathy, and intercultural communication skills, so important in today's global world. Working in international teams in a virtual way brings them closer to the real world of their profession and broadens their horizons through learning other ways of working and applying the law. Simulation integrates reality and context with academic learning and involves students in their learning process in an active rather than passive way. We believe that simulation provides a perfect bridge between the academic context and the world of work. When students face the scenario, they have all the instructions and guidelines, but they must work from their profile "out of the box," investigate, reflect, negotiate, and solve problems similar to how they would in their professional life where we are not given instructions on how to proceed because a good legal professional is expected to know how to meet the challenges they face. Legal

professionals must adapt to the demands of an ever-changing global society that requires solutions to complex problems.

Therefore, we must prepare our students for what will be required of them in their professional future; they must be able to resolve conflicts and advise their clients, research, and study the ever-changing laws, and the simulation together with the virtual exchange contribute to the formation of flexible professionals who adapt to the new challenges of today's society.

References

Dickerson, D. (2000). In Re Moot Court, 29 Stetson L. Rev. 1217 (2000). https://repository.law.uic.edu/cgi/viewcontent.cgi?article=1646&context=facp ubs

Daly, Y. M., & Higgins, N. (2011). The place and efficacy of simulations in legal education: A preliminary examination. *All Ireland Journal of Higher Education*, 3(2).

Estellés, P. (2021). Nuevas oportunidades de mejora en la docencia y evaluación docente derivadas del estado de alarma generado por el covid-19. *Cuadernos Jurídicosdel Instituto De Derecho Iberoamericano, 1*, 254–269.

Galindo Caldés, R. (2020). La simulación en derecho de la función pública: Representación sindical y negociación colectiva. *Revista De La Facultad De Derecho De México, 70*(278–1), 71–90.

García, D. (2018). La simulación como herramienta de enseñanza-aprendizaje de competencias profesionales en el ámbito jurídico-penal. Experiencias en el aula. Actas III Congreso internacional virtual sobre La Educación en el Siglo XXI, pp. 326–333.

Garrido, J. (2010). Clases prácticas y asistencia a las mismas por parte del alumnado. Un exempla en enseñanzas técnicas. I Jornada Sobre Innovación Docente y Adaptación Al EEES *en las Titulaciones Técnicas*, Godel Impresores Digitales S.l., Granada, pp. 125–28, en p. 128.

Lopez, E. L. (1982). Asistencia a clase y rendimiento. *Revista Española de Pedagogía*, 95–101.

Maharg, P., & Nicol, E. (2014). Simulation and technology in legal education: A systematic review and future research programme. *Legal education: Simulation in theory and practice*, 17–42

O'Dowd, R. (2018). From telecollaboration to virtual exchange: State-of-the-art and the role of UNICollaboration in moving forward. *Research-Publishing. Net, 1*, 1–23.

Pérez, J., & Graell, S. (2004). Asistencia a clase y rendimiento académico en estudiantes de medicina: La experiencia de la Universidad Autónoma de Barcelona. *Educación Médica, 7*(2), 85–89.

Phillips, E. (2012). Law Games–Role Play and Simulation in Teaching Legal Application and Practical Skills: A Case Study. Compass: *The Journal of Learning and Teaching at the University of Greenwich*, *5*, 1–4.

Rodriguez, C. & Herrera, L. (2009). Análisis correlacional-predictivo de la influencia de la asistencia a clase en el rendimiento académico universitario. Estudio de caso en una asignatura. Profesorado. *Revista de Currículum y Formación de Profesorado*, *13*(2), 1–13.

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18

Simulation + Virtual Exchange in English for Specific Purposes: "The Case of Marketing Across Cultures" and "Think Local, Work Global in Virtual Teams"

Rut Muñiz and Dorsaf Ben Malek

Overview

English is the lingua franca used in the scientific and academic contexts; the media and communication contexts; the business and trade contexts; the international political and diplomacy contexts; and of course, the Internet. Therefore, the number of non-native speakers of English already outnumbers native speakers besides the fact that English is taught in many different areas and there is an important teaching and publishing industry derived from all these factors. English for Specific Purposes (ESP) is one of the areas of teaching English that has gained great importance in the last 40 years and as Hyland states (2021) "English for Specific Purposes is based around the simple idea of researching and delivering specific, learner-centred language instruction". But teaching English is not enough in the current globalized world, students also need to learn other skills that complement the English language training and that prepare them for their professional future. Due to this fact teaching Intercultural Communication (IC) is a must in Higher Education and more specifically in the ESP learning and teaching contexts. Intercultural communication refers to the communication between people from two or more different sociocultural backgrounds. Byram (Byram, M. (2003) Intercultural Competence. Language Policy Division DG IV—Directorate of School, Out-of-School and Higher Education Council of Europe, Strasbourg.) describes as crucial the acquisition of intercultural understanding and the ability to act in linguistically and culturally complex situations. As a consequence, we need to prepare our students to be linguistically competent but also teach them the intercultural communication

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competence. In this chapter, we are presenting two virtual exchange projects that enhance the ESP teaching–learning experience and at the same time provide students with the possibility of gaining the intercultural communication competence that books do not really offer in a regular course. Through these experiences, the students had a meaningful learning which developed their intercultural communication skills for their future profession, and they also enhanced their digital competence and business and legal English competence as well as built their teamwork ability with people from diverse cultural backgrounds. Furthermore, these two projects can be taken as a basis for future simulation + virtual exchange projects in the ESP teaching in Higher Education in order to pursue a better teaching quality and foster the investigation for teaching innovation.

Keywords

English for specific purposes · Intercultural communication · Virtual exchange · Simulation

Learning Objectives

The current chapter deals with the learning objectives emerging from both virtual exchange and simulation in relation to English for Specific Purposes (ESP).

By the end of this chapter, readers should be able to understand how

- ESP students' intercultural communicative competence (ICC) is developed to build their international careers;
- ESP students' media literacy is developed in order to collaborate effectively in virtual teams;
- to enhance ESP students' English and communication skills.

18.1 Introduction

The growing importance of English as a language for international and thereby intercultural communication originates in the growing influence of the latest trends such as globalization and the linkage between international trade and economy with Americanisation (Philipson, 2001). According to recent United Nations statistics, non-native speakers of English clearly outnumber that of the native speakers worldwide (1.7 billion > 450 million). Added to that is the enormous number of international organizations which use English as an official language, let alone the academic articles published in English. These figures show the alteration of the status of English as standard English to global English, world English, or international English (Candel-Mora, 2015). This transformation into a global status has

put the speakers of English (whether native or non-native) into the obligation of interacting with people from diverse cultural backgrounds. Therefore, intercultural communicative competence (ICC) is added to the linguistic and communicative competences. It allows speakers of English as a lingua franca to use both linguistic and communicative competences effectively. This addition marked a shift from a deficit view of the language learner aspiring to native speaker competence to the language user becoming an "intercultural speaker" who has knowledge of one or more cultures and social identities and maintains relations with people from other cultural backgrounds (Byram, 2009). To this end, several theories, methods, and instruments have been adopted by English for Specific Purposes (ESP) teachers to integrate ICC within ESP syllabi and classrooms. In this chapter, we will focus on two pedagogical approaches, simulation and virtual exchange (VE), that we propose in combination to enhance the ESP teaching-learning process. On the one hand, simulation is one of the tools that has proved to be effective in engaging ESP students in real-life situations (Madsa, 2012; Kolomiets & Konoplenko, 2015; Marcovic, 2016; García- Carbonell & Watts, 2007; García-Carbonell & Andreu-Andrés, 2012).

Being an active pedagogical approach successful in raising students' interest, stake, engagement, and investment in their work, it instils inspiration and motivation and promotes deeper learning (Crookall, 1990: 167). On the other hand, VE has been researched and used in varied ESP courses (Nicolau, 2020; Hoskins & Reynolds, 2020; Czura, 2021; Verzella et al., 2021; Healy et al., 2020). The flexibility that virtual exchange offers is ideal for designing a tailor-made ESP course since it fulfils the main objectives of such a course, as we will discuss below. Thus, the intent of this chapter is to examine the characteristics of ESP, the integration of ICC in it, and the role of simulation and virtual exchange in developing ESP students' ICC and other competences urgently needed in their international professional careers such as collaborating in virtual teams and English language proficiency.

18.2 Teaching English for Specific Purposes (ESP)

The English for specific purposes (ESP) teaching objective is to initiate the learners to the necessary language in specific domains, vocations, or occupations from which English for specific purposes got its name. Thus, the purpose of ESP teaching is to meet the specific needs of learners in specific situations. In this vein, each situation dictates the kind of teaching methodology and the choice of language that is appropriate to the activities in specific disciplines.

Hutchinson and Waters (1987: 19) declared that "ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning." According to González Ardeo (2012), ESP is also taught to offer a greater opportunity for professional mobility. This latter is mainly constructed over communicative as well as intercultural communicative competence on top of an adequate proficiency in language level.

The contextualization of communication as well as an adequate knowledge of the language are necessary for successful practice within the communicative approach to ESP teaching (Gilmore, 2004). Thus, ESP practitioners who lack "functional academic literacy" apart from the linguistic literacy will generally fail in integrating authentic texts and activities within their students' field of study (González Ardeo, 2012: 223). The features of ESP can be summarized in three: authentic materials, purpose-related orientation, and self-direction. The first refers to the feasibility of using authentic corpora to teach ESP. The second refers to the anticipation of occupational situations which may require the simulation of communicative tasks. The third feature refers to the ability of ESP learners to decide upon when, what, and how they will learn.

English for specific purposes encompasses two major components; ESP learners' needs analysis and the ESP practitioner. Both of them are important in the teaching/learning process. Their views are vital to reflect on that process. ESP practitioners need to know about the needs, wants, lacks, and necessities of the learners by conducting needs analysis. ESP learners' needs are divided into subject and language knowledge as well as communicating in target potential situations during their professional careers. Because of the aforementioned cultural diversity in the workplace, the communication component must include the preparation for future intercultural encounters.

18.3 Integrating Intercultural Communication in English for Specific Purposes

The main challenge in ESP teaching within a globalized world is how ESP teachers can manage to adopt the intercultural approach to ESP learners' requirements. Thus, specific strategies, methods, and tools may be called for to integrate intercultural communication as a fundamental learning outcome in ESP, just as positively solicited as teaching the language and the content.

As stated by Abdallah (2012) what characterizes our "global era" is the extensive use of the English language as the principal language for "high tech environment and international workplace." (Abdallah, 2012: 1). In fact, the rapid technological progress and workplace metamorphosis into multicultural space helped a lot in changing the status of English to a lingua franca. They participated in making the use of English the main means of interpersonal and professional communication. Therefore, new skills are now spotlighted because of their significance in making individuals more prepared to be involved in intricate and diverse exchanges across cultures. Hence globalization, which is now at the heart of education, has set up new requirements in different teaching areas. It has also interfered with how the interaction between native and non-native speakers of English should be perceived, bearing in mind that teaching/learning any language does not happen randomly but within a meaningful situation. This latter is the basis for every interaction; otherwise, people would talk nonsense. Thus, ESP learners usually enter significant

communicative situations with members of the target language in the textbook or material and their discourse community fellows. One condition for communication to be successful is the development of the cultural dimension (Abdallah, 2012).

Consequently, insufficiency of cross-cultural understanding has been identified as one of the reasons for communicative failure in occupational settings, which results in a business loss (CiLT, 2005). Therefore, one of the emerging challenges that ESP teachers face is bridging the gap between learners' needs and potential target situations (Abdallah, 2012). Indeed, societies that intend to prepare their members to live in "an internationalized culture and globalized economy" must be ready to integrate ICC to meet that objective (Alfred & Byram, 2002: 351).

Developing learners as intercultural speakers is the logic behind integrating intercultural competence as a learning objective in ESP. To this end, ESP practitioners should focus not only on developing the grammatical competence but also on preparing learners for written and spoken interaction in a multicultural workplace (Abdallah, 2012).

Aguilar (2018) preaches for adopting ICC as a learning objective in ESP syllabi. Research showed that English as a Medium of Instruction (EMI) content lecturers are not directly concerned with developing ICC dimension because they are not interested in teaching the language (Airey, 2011; Arnó-Macià & Mancho-Barés, 2015). Therefore, ESP practitioners are better positioned to develop ICC since they know how to conduct needs analysis and integrate ICC into the ESP course (Aguilar, 2018).

18.4 Virtual Exchange in English for Specific Purposes: "The Case of Marketing Across Cultures" and "Think Local, Work Global in Virtual Teams"

Over the last twenty years, VE has gained a preferential position in higher education and has experienced a new fervour at universities that head for internationalization as an institutional goal. Not only does VE provide the advantage of developing subject-related skills, but also enabling skills leading to employability: intercultural communication, virtual teamwork, and problem-solving. There are quite a few studies of telecollaboration in the area of English for specific purposes (Hoskins & Reynolds 2020; Czura, 2021; Nicolau, 2020; Healy et al., 2020), and our humble goal is to contribute to the field, taking into account all the requirements of today's professional and global world. Below we present two virtual exchange projects that can serve as a basis for the creation of simulation + virtual exchange proposals.

In this chapter, we present the implementation of two Erasmus+ Virtual Exchange (VE) for ESP learning to foster ICC focusing on the workplace through global virtual teams. The two VE projects (a) "*Marketing Across Cultures"* and (b) *"Think Local, Work Global in Virtual Teams"* were conducted by two ESP teachers from the Universidad Católica deValencia in Spain (UCV) and the Université Virtuelle de Tunis in Tunisia (UVT).

During the Fall of 2019, the authors of these two VE attended a training (basic and advanced) offered by UNICollaboration, which is a cross-disciplinary professional organization for telecollaboration and virtual exchange in Higher Education in partnership with the Erasmus+ VE project. The Erasmus+VE project was launched in 2018 with the aim to expand the reach and scope of the Erasmus+ programme via virtual exchanges by using technology to link young people in Europe and Southern Mediterranean countries. The main objective was to connect young people through technology and carry out learning activities to foster intercultural dialogue (Helm & Acconcia, 2019). As stated by Helm and Acconcia (2019), the specific objectives of the project as defined by the European Commission are the following:

- Encourage intercultural dialogue and increase tolerance through online people-to-people interactions.
- Promote various types of virtual exchange as a complement to Erasmus + physical mobility, allowing more young people to benefit from intercultural and international experiences.
- Enhance critical thinking and media literacy, and the use of the Internet and social media.
- Foster soft skills development of participants, including the practice of foreign languages and teamwork, notably to enhance employability.
- Support the objectives of the 2015 Paris declaration to promote citizenship and the common values of freedom, tolerance, and non-discrimination through education.
- Strengthen the youth dimension of the EU neighbouring policy with Southern Mediterranean countries.

As a result of this VE training, two virtual exchange research projects arose as we collaborated in the design, implementation, and evaluation of both projects. We both teach ESP in various undergraduate and master's degree programmes. The students involved in the projects belonged to the following degree programmes at the two universities:

(a) Spain: Degree in Business Administration and Management, degree in Multimedia and Digital Arts, degree in Law, and master's degree in Maritime Law.
(b) Tunisia: Bachelor of Management Science and Master of Network and Technology.

The first VE *Marketing Across Cultures* (MAC) took place during April 2020 involving twenty students from both universities as it was a pilot project. The second one *Think Local, Work Global in Virtual Teams* took place during the month of November 2020 titled involving thirty students.

Both research studies were divided into three phases: project design, virtual exchange, and evaluation. The analysis of the data was based on three perspectives: intercultural communicative competence, collaboration in virtual teams, and practicing the English language in professional contexts.

The design phase was divided into the following:

Planning. We carried out this preliminary stage through online collaborative synchronous sessions (ZOOM) and asynchronous sessions (Google Drive) for 2 months. We brainstormed and planned the project-based learning (PBL) as well as the learning objectives of each VE and at the same time we had close contact with the coordinator representing UNICollaboration always informing her about all the steps. UNICollaboration and Erasmus+VE offered us a Moodle platform to be used by all the participants during the TEP (Transnational Erasmus Project) that is the VE. During the implementation of all the activities we also had technical support available if needed provided by UNICollaboration.

Organization. In this phase, we recruited the potential candidates to participate in the VE projects. Students were informed about what a VE is, the learning objectives, the length of the project, the partner university, and the certification they would receive (an Erasmus+ digital badge that certified that they had successfully completed the Erasmus+ VE), and they had certain competencies and had taken part in certain activities.

The students participating were from Tunisia, Spain, France, Italy, Nicaragua, Poland, Ukraine, Hungary, and Venezuela.

Being a pilot project, the participation was voluntary. Therefore, only the students that were really interested in the programme signed in and were committed to actively participate. See Table 18.1.

The VE phase lasted 4 weeks and each week had a specific purpose. The first week was the preparation phase where students introduced each other, talked about their own expectations and feelings, and discovered together what the VE was about. Thus, they participated in forums, and they had the first synchronous session facilitated by the two professors. In the second week, the reflection phase took place. They had to watch several videos that depicted marketing campaigns across Asian cultures in the case of the MAC-VE and in the case of the second project the videos described how different people made change in society possible through

Table 18.1 Learning objectives for "Marketing Across Cultures" project. (MAC)

Develop their cross-cultural communication skills and overcome cultural barriers
Improve their Business English communication skills
Learn about working in global virtual teams, sharing the same goals, visions, and compromising
Learn about business culture in different countries
Work in an international project or task simulating the professional context through building trust

their professions. Then, they had to reflect on them by comparing how the different topics are handled in their cultures and in the videos. During this week, they had a synchronous facilitation session with an Erasmus+ facilitator where they had to interact in teams and carry out activities dealing with culture awareness.

In the third and fourth weeks, the interaction and production phases were conducted. See Table 18.2 The students interacted in teams with mixed nationalities discussing and comparing the suggested topics from their own cultural perspectives and prepared for the final presentation. In the case of the *MAC*-VE, they had to design a marketing campaign of a specific product or service and adjust it to their own culture bearing in mind the target market and its cultural characteristics. While in the case of the second VE, "*Think Local, Work Global in Virtual Teams",* the teams had to identify a challenge in their community that could be the same in another country and design a project for their communities' welfare considering the cultural differences but also the similarities.

During these two weeks, they had two more synchronous sessions with us acting as facilitators where we monitored and assisted them. In addition, they also had their own team synchronous sessions without the facilitators' supervision. In the last synchronous session, all the teams had to present their projects to all the participants including the facilitators.

The evaluation phase took place alongside all the projects. During the VE, we were present and interacted with the teams in the synchronous sessions (ZOOM/TEAMS), and the sessions were recorded for later analysis. At the end of the VE, the participants answered a Likert-type questionnaire to reflect on their learning experiences.

Results were in line with the quasi-consensus over the efficiency of virtual exchange projects in improving students' intercultural communicative competence (Belz & Müller-Hartmann, 2003). Indeed, four-fifths of the participants affirmed that through the MAC course they learned about how marketing is seen and made differently across cultures. They also agreed on the fact that the VE made them open to other cultures by suspending prejudices and misbeliefs about them. They can now relativize their own cultural practices and beliefs. These aspects are among the components of ICC according to Byram (1997). In the same vein, during the

Table 18.2 Learning objectives for "Think Local, Work Global Through Virtual Teams"

Talk about change in their own culture and their partner's culture
Solve certain problems that affect both communities
Prepare and present a project for their communities' welfare
Develop their critical thinking
Collaborate in virtual teams
Develop their intercultural communicative competence

reflection phase, the participants reflected on videos about other cultures by finding similarities and differences with their respective cultures. According to Kramsch (1996) and Byram (1997), it might be beneficial to expose learners to a third culture in order to take a third position. This way learners can adopt a third stance and relativize their own practices and beliefs. It is through relating and comparing cultures to theirs that intercultural learners can deduce that there are more similarities than differences between cultures. Now they are well prepared to meet and collaborate with people of diverse cultural backgrounds. In this vein, one of the participants wrote on the farewell forum.

> I always had the conviction that cultural differences do not represent a blockage as some people imagine, on the contrary these differences allow us to complement each other and produce some innovative things, and that was confirmed to me through the work in a team that I felt homogeneous during the production phase with my two teammates. (S1)

In relation to the second learning objective, collaborating in virtual teams, all the participants affirmed that now they can collaborate effectively in virtual teams. They feel prepared to work in an international professional context. Besides, four-fifths of them showed their interest in doing international work as part of their career because they are now more equipped to survive intercultural encounters. Indeed, all of them confirmed that due to their virtual exchange via online channels, they became able to use technology effectively to communicate with members of other cultures, which is at the heart of virtual exchange aims. Knowing that others might be different from them and that they should accept them as they are is the secret of successful international careers. However, one-third of them think that because cultural diversity is just a fact of life, calling attention to cultural differences is necessary and potentially divisive. During the interaction and the production phases, the participants made simulations to real-life professional situations in which they should design marketing campaigns in the first VE and envisage problems and then find valid solutions for them in the second VE. In their simulation process, the participants were not assisted by the facilitators. Indeed, the tutors declared that they would not give the students ready-made solutions on how they would collaborate virtually.

They should find solutions and adapt ways to communicate, assign roles, and collaborate in virtual teams by themselves. The participants admitted that in this simulation they used a variety of tools such as Zoom for their meetings and WhatsApp, Facebook, and Instagram for their asynchronous communication. They adapted the tools they are acquainted with in their daily lives to their simulation of professional virtual collaboration. Third, in relation to the third learning outcome, 90% of the participants affirmed that they improved their ability to communicate in English and that they developed their English skills by practicing the language through writing in forums or speaking during synchronous sessions. What made this possible is the fact that the participants together with their tutors and facilitators in both VEs are non-native speakers of English. This made them comfortable while practicing the language. The following is what a student wrote on the farewell forum to depict how she developed her English and communication skills.

> At first, I was a bit nervous because I was very shy and I always found it difficult to speak with other people in my language, imagine in English. I was scared!! This feeling disappeared as soon as we started having small group conversations and we got to know each other more, know about our cultures and about ourselves. I had really good times and quite interesting conversations with interesting people. I felt very comfortable when speaking to them. (S2)

Furthermore, when asked to reflect on their learning experience within both VEs, the participants expressed their satisfaction and confirmed that the learning outcomes and their expectations from the courses were fully met.

18.5 Future Proposals for ESP VE + SIM Projects

As we have learnt from these two projects, our intercultural virtual collaborations foster professional skills such as digital skills, critical thinking, virtual team building, intercultural communication skills, and working in multidisciplinary teams. VE participants learn how to overcome cultural barriers, build awareness of different cultural norms, and understand the differences by accepting and respecting them. So why not go a little further and combine synergies between these two innovative methodologies? This book sheds light on the possibilities offered by simulation in the educational world in collaboration with the virtual exchange. Therefore, the collaborative approach we are proposing in this chapter is ideal for ESP learners. As has been repeatedly emphasized in this book, through simulation, participants become involved in a reality in which they must find solutions to certain problems or situations.

They must research the topic related to the scenario, propose ideas, negotiate, and make decisions (Angelini, 2021). Moreover, participants must consult texts and audio-visual material, work in teams, and at the same time respond to the challenge with their own judgment and knowledge as they would in real life. According to Angelini (2021), the use of simulations in education leads to the development of competences that the trained educator/facilitator must know how to enhance, for example, experiential learning; dialogic learning; linguistic, critical, and reflective thinking; and social competences. All the above-mentioned relates to the development of the key competencies of the future professional in any context or geographic location.

Thus, simulation and VE offer an enhanced ESP teaching/learning environment (Figs. 18.1 and 18.2).

We believe that both pedagogical strategies, simulation + VE, offer a perfectly adequate formula for ESP teaching. The combination of synergies offers twenty-first-century learners an adequate preparation for the needs of the global era in which people from vastly different backgrounds work in international teams to achieve international projects.

Fig. 18.1 Examples of digital badges awarded by Erasmus + VE

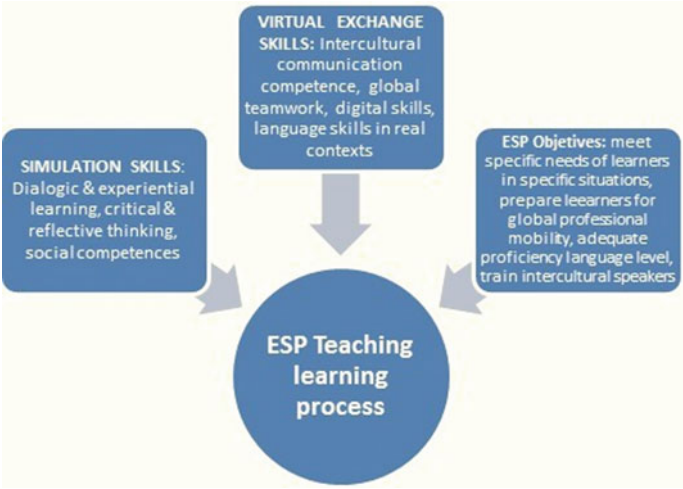

Fig. 18.2 Key skills of simulation and VE that in combination enhance the ESP teaching–learning process

In this way, we reflect on the extent to which simulation enhances learning in combination with virtual exchange. Trainees must assume responsibilities through the assigned profile. They must place themselves in a quasi-real professional scenario, and they must prepare themselves for negotiation and teamwork.

They must overcome cultural barriers and empathize with their international colleagues. In this context, the use of English is essential, but the acquisition of intercultural communication skills is equally crucial to reach an understanding and a solution to the challenge they have been given. Therefore, the virtual exchanges following the project-based learning methodology described in this chapter could be a solid proposal for the creation of a simulation for the teaching of ESP with an intercultural approach.

References

Angelini, M. L. (2021). *Learning Through Simulations: Ideas for Educational Practitioners*. Switzerland: Springer Nature.

Aguilar, M. (2018). Integrating intercultural competence in ESP and EMI: from theory to practice *ESP Today*. *Journal of English for Specific Purpose at Tertiary Level*. Vole 6 (1):25 https://doi.org/10.18485/esptoday.

Airey, J. (2011). Talking about teaching in English: Swedish university lecturers' experiences of changing teaching language. *Ibérica, 22*, 35–54.

Alfred, G & Byram, M. (2002). Becoming an intercultural mediator. *Journal of Multilingual & Multicultural Development*, Vol 23:5. Clevedon. Multilingual Matters Ltd.

Arnó-Macià, E., & Mancho Barés, G. (2015). The role of content and language in content and language integrated learning (CLIL) at university challenges and implications for ESP. *English for Specific Purposes, 37*, 63–73.

Benabdallah, A. (2012). ESP teaching in the light of globalization: A cross-cultural proposal. *English for Specific Purposes World, 12*(35), 1–7.

Belz, J. A., & Müller-Hartmann, A. (2003). Teachers as intercultural learners: Negotiating German-American telecollaboration along the institutional fault line. *The Modern Language Journal, 87*(1), 71–89.

Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.

Byram, M. (2003) Intercultural Competence. Language Policy Division DG IV – Directorate of School, Out-of-School and Higher Education Council of Europe, Strasbourg.

Byram, M. (2009). The intercultural speaker and the pedagogy of foreign language education. *The SAGE handbook of intercultural competence*, 321–332.

Candel-Mora, M. A. (2015). Attitudes towards intercultural communicative competence of English for specific purposes students, 15th International Conference of the Spanish Association of Language and Literature Education, 19–21 November 2014, Valencia, Spain, *Procedia Social and Behavioral Sciences*, 178: 26–31. ELSEVIER.

CiLT, The National Centre for Languages (2005), Talking World Class: the impact of language skills on the UK economy. UK: *The National Centre for Languages*, http://www.cilt.org.uk/pdf/pubs/talking_world_class.pdf.

Crookall, D., & Oxford, R. L. (Eds.). (1990). *Simulation, gaming, and language learning*. Newbury House.

Czura, A. (2021). Virtual exchange in foreign language for specific purposes courses: assessment strategies and tools [TAPP-Virtual exchange]. In *Multilingual academic and professional communication in a networked world.* Proceedings of AELFE-TAPP 2021 (19th AELFE Conference, 2nd TAPP Conference). Vilanova i la Geltrú (Barcelona), 7–9 July 2021. Universitat Politècnica de Catalunya.

García-Carbonell, A., & Watts, F. (2007). Perspectiva histórica de simulación y juego como estrategia docente: De la guerra al aula de lenguas para fines específicos. *Ibérica, Revista De La Asociación Europea De Lenguas Para Fines Específicos, 13*, 65–84.

García Carbonell, A., Watts Hooge, F. I., & Andreu Andrés, M. A. (2012). Simulación telemática como experiencia de aprendizaje de la lengua inglesa. *REDU: Revista de docencia universitaria,* 10(3), 301–323.

González A. J. M. (2012). Overlapping of ESP/ EAP and content courses revisited. *Revista de Lenguas para Fines Específicos*, 18. 213–236.

Gilmore, A. (2004). A comparison of textbook and authentic interactions. *ELT Journal, 58*(4), 363–374.

Healy, S., Tsubota, Y., & Kennedy, O. (2020). Analysis of a Japan-Philippines telecollaboration from a social realist perspective. *EUROCALL, 2020*, 96.

Helm, F., & Acconcia, G. (2019). Interculturality and language in Erasmus+ Virtual Exchange. *European Journal of Language Policy 11*(2), 211–215. https://www.muse.jhu.edu/article/737426

Hoskins, L., & Reynolds, A. (2020). Implementing E+ VE at the University of Bordeaux within English for specific purposes courses. *Designing and implementing virtual exchange–a collection of case studies*, 179–190.

Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centered approach*. Cambridge University Press.

Hyland, K. & Feng, K.J. (2021) Delivering relevance: The emergence of ESP as a discipline. *English for Specific Purpose,* Vol 64 (p. 13–25)

Kolomiets, S. S., & Konoplenko, L. O. (2015). A model for teaching speaking English for Specific Purposes (information security) using business games. *Advanced Education* https://ela.kpi.ua/bitstream/123456789/13188/1/12.pdf

Kramsch, C., Cain, A., & Murphy-Lejeune, E. (1996). Why should language teachers teach culture? *Language, Culture and Curriculum, 9*(1), 99–107.

Madsa, T. (2012). Motivating Students' Speaking Skill Through Simulation in English for Specific Purposes. In *1st Mae Fah Luang University International Conference*, Thailand (pp. 3–6).

Marković, T. (2016). The Design and Implementation of Simulation as an Experiential Technique in English for Specific Purposes (ESP). *Belgrade English Language and Literature Studies, 8*(1), 159–175. https://doi.org/10.18485/bells.2016.8.9

Nicolau, A. (2020). Designing a virtual exchange intervention for the development of global competence: an exploratory study. In P. Zaphiris & A. Ioannou (Eds.), *Learning and Collaboration Technologies. Designing, Developing and Deploying Learning Experiences. HCII 2020. Lecture Notes in Computer Science*. Switzerland: Springer Nature AG. https://doi.org/10.1007/978-3-030-50513-4_38

Phillipson, R. (2001). English and the world's languages. *Humanising Language Teaching*, *3*(6).

Verzella, M., Macià, E. A., & Maylath, B. (2021). Engineers taking a stance on technical communication: Peer Review of oral presentations via the trans-atlantic and pacific project. *IEEE Transactions on Professional Communication, 64*(1), 66–83.

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The Role of Simulation and Virtual Exchange in the Context of EFL Pre-service Teacher Training in Romania

19

Raluca Pop

Overview

Simulation, as a form of experiential learning, provides EFL learners with a meaningful context to enhance language competence and develop transversal skills (intercultural competence, interpersonal competence, problem-solving, critical thinking, etc.) as stated in Chaps. 3, 10 and 12 from this volume. The outcomes of simulation and virtual exchange have been acknowledged through empirical research that points out the versatility of incorporating these activities in the formal educational environment. The constant need to adapt teaching practices to the requirements of twenty-first-century society is reflected in the educational priority to improve the quality and efficiency of education and training (European Commission, ELT Journal, 66(1), 42–51. 10.1093/ELT/CCR027., p. 9). Because foreign language learning entails communicating efficiently across cultures and languages, practitioners should incorporate students' diverse linguistic and cultural backgrounds in the formal classroom setting. In the same line of thought, teacher training programmes should be infused with an intercultural perspective that promotes an inclusive and culturally responsive teaching. This chapter identifies the potential of simulation and virtual exchange to develop undergraduate students' language skills, intercultural communicative competence, digital skills and pedagogical knowledge. For a wider perspective on simulation and virtual exchange in teacher training, please refer to Chap. 16 in this volume.

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Learning Objectives

By the end of the chapter, educators and practitioners will be able to

- understand the benefits of integrating simulation and virtual exchange in pre-service teacher training;
- reflect on the outcomes of simulation and virtual exchange: language competence, intercultural communicative competence, digital skills and professional development.

19.1 A Change of Mindset in Pre-Service Teacher Training Education. A Focus on Babe-Bolyai University in Romania

The fact that the learning a foreign language entails awareness of overcoming "both a linguistic and a cultural gap" (Collie & Slater, 1997, p. 6) led in the past two decades to the emergence of an intercultural turn in language learning (Byram, 1997, 2009; Kramsch, 1998; Sercu et al., 2005) which requires teachers and students to demonstrate intercultural knowledge, abilities and attitudes that make communication across cultures and languages more efficient. Consequently, teachers are encouraged to exhibit culturally responsive teaching and reflect on the pedagogical implications of multiculturalism and multilingualism in the foreign language classroom. An intercultural perspective in teaching a foreign language acknowledges that language "is not a culture-free code" (Kramsch, 1998, p. 8) and that the communicative context informs the speaker on the appropriate choice of words, the correct register or the right tone of voice. The mere transfer of sociocultural norms from one's mother tongue to a foreign language might be conducive to failure in communication as languages operate under different norms (Taguchi, 2012). Therefore, foreign language teachers are urged to take a more active role in fostering for students a learning space in which the deeply rooted relationship between the broader concepts of "language" and "culture" is acknowledged. Likewise, students would gain a two-fold competence in language and intercultural communicative skills.

As the Romanian educational context is concerned, an analysis of the literature indicates that the interest in infusing an intercultural perspective in pre-service teacher training has increased steadily in the past decade. Several authors have put an emphasis on the need to incorporate an intercultural dimension in pre-service and in-service teacher training (Bârlogeanu, 2005; Cosma & Cosma, 2006; Pop, 2015, 2018, 2019; Vlădescu, 2011). The quality of education represents a salient component in every society. Therefore, the "responsibility for educating pre-service teachers has reached a considerable high level" (Pop, 2018, p. 95) as teachers need to be able to equip students with suitable skills to manage the educational requirements of the twenty-first century. In the international context, researchers

and empirical studies (Byram, 2009; Liddiecoat & Scarino, 2013; Sercu, 2005; Wood, 2009) as well as various directives and educational policies (The White Paper on Intercultural Dialogue, 2008; Recommendation 2006/962/EC on key competences for lifelong learning, 2006; The Aims of Language Teaching and Learning, 2010; Developing the Intercultural Dimension in Language Teaching—A Practical Introduction for Teachers, 2002) endorse the need to provide meaningful teaching that acknowledges students' diverse social, cultural and linguistic backgrounds. To do so, pre-service teachers need to develop their intercultural communicative competence in addition to their subject matter knowledge and their pedagogical knowledge as "teachers of language need to become teachers of language and culture" (Byram, 2009, p. 331).

19.2 The Intercultural Communicative Competence of a Foreign Language Teacher

Because teachers of foreign languages become mediators across languages and cultures, they need to apply a cultural lens when they explore in the classroom various authentic teaching resources or when they organise academic activities. In this case, the development of a certain degree of intercultural communicative competence is implied (ICC). According to the competence-based paradigm in education, competences consist of knowledge (information within a certain subject), skills (procedural knowledge) and attitudes (a certain mindset) (Council Recommendation 2018, p. 7). The ICC model proposed by Byram (1997) comprises five elements: intercultural knowledge, intercultural attitudes, critical cultural awareness, skills of interpreting and relating and skills of discovery and interaction. Byram (1997, pp. 34-38) suggests that an individual should have knowledge about various forms of culture and the ability to interpret a resource from another culture and demonstrate an open, positive attitude towards otherness.

The development in compulsory education of the eight key competences (CEFR, 2001) represents a solid basis for the Romanian educational system. The school curriculum for English as a foreign language places emphasis on integrating both language and culture in the teaching process. Thus, learners are encouraged to express curiosity about certain elements specific to the target language culture (School curriculum for English, secondary level, 2017, p. 4), to identify elements that are specific to L1 culture and to the target language culture (School curriculum for English, secondary level, 2017, p. 10) or to show interest in knowing personalities and cultural events (School curriculum for English, secondary level, 2017, p. 13). Because the school curriculum for English focuses on the development of both language skills and ICC, teachers of English should be able to demonstrate their intercultural knowledge, abilities and attitudes in concrete teaching situations. Table 19.1 indicates some examples of knowledge, skills and attitudes that target a combination of language and culture-based elements that need to be mastered by a foreign language teacher:

Table 19.1 Teachers' intercultural knowledge, skills and attitudes

Knowledge	Discuss with learners' culture specific and culture general knowledge related the target language; enquire about socio- cultural norms in one's mother tongue and in the foreign language; point out issues of identity in the context of being a non-native speaker
Skills	Incorporate in the teaching of a foreign language authentic resources that depict various registers of language use and discourse; organise for learners various learning opportunities to interact effectively with people from diverse social and cultural backgrounds
Attitudes	Encourage learners to have positive attitudes towards different cultures and be tolerant towards cultural characteristics that are distinct from one's own culture; explore with students what means to be open-minded and respectful in different communicative situations

The European Profiling Grid (EPG) indicates various descriptors related to the three development stages of a teacher's intercultural competence (https://egrid.epg-project.eu/en/egrid#). In phase I, which corresponds to a beginner level, the teacher demonstrates awareness of the fact that language and culture should be taught in an integrated manner. At this stage, the teacher is able to include in the lessons factual knowledge about specific and general elements of the target culture. In phase II, which corresponds to an intermediate level, the teacher demonstrates the ability to avoid intercultural problems arising in the classroom and to identify the best suitable resources to match the cultural horizon of learners. In phase III, which corresponds to a proficient level, the teacher can make use of his/her intercultural knowledge and awareness in order to help less experienced colleagues to include ICC in their teaching and is able to design projects and presentations to broaden both his/her and students' perspective of intercultural issues.

19.3 Incorporating Simulation into Teaching English Didactics at Babe-Bolyai University

English Didactics is an elective course offered to undergraduate students at the Faculty of Letters, Babeș-Bolyai University of Cluj-Napoca. It is part of a three-year pre-service teacher training programme. The topics tackled in this course (e.g., teaching grammar and vocabulary, teaching receptive and productive skills, teaching, etc.) are infused with an intercultural perspective as students are encouraged to explore in detail the deeply rooted link between language and culture and the pedagogical implications that emerge in the teaching of English.

This intercultural perspective permeates the three areas that prospective teachers should acquire: subject matter knowledge, pedagogical knowledge and knowledge about how diverse students learn. These three pillars can be enhanced through simulation and virtual exchange. As follows, some directions are provided.

Simulation focuses on a learner-centred perspective guided by experiential learning, on the use of authentic materials and situations, on involving students in making meaning while connecting previous knowledge with current information, on promoting collaborative learning and on achieving shared academic goals (see Chaps. 1-8 in "*Simulation Essentials*"). Research carried out with the aim to investigate students' communicative competence indicates that simulation has proven to be an efficient and creative tool for language acquisition (Garcia- Carbonell et al., 2001; Tomlinson & Masuhara, 2000; Angelini, 2012, 2019). Several empirical studies confirm the effectiveness of using simulations to enhance students' production skills (Angelini & Garcia-Carbonell, 2019 a and b; Ayudhya, 2015; Choudhary, 2013; Hardianty & Mukrim, 2013). A simulation-based instruction integrated into a speaking activity can contribute to students' progress in areas related to vocabulary, pronunciation, variety of expression and grammar (Angelini & Garcia-Carbonell, 2019, p. 3). Simulations are valuable in communicative activities because they provide students with the possibility to voice their opinions, master turn-taking and build their fluency, accuracy and coherence.

The strengths of simulation in a pre-service teacher training course reside in the fact that participants make use during the activities of "their own judgment and knowledge" (Angelini, 2021, p. 1) and do not act according to a script or a roleplay. Likewise, they develop ownership of learning while knowledge is constructed step by step. As far as foreign language teaching is concerned, because simulation utilises authentic materials and presents a lifelike situation that needs to be analysed, it provides "greater exposure to the target language" (Angelini, 2021, p. 9). Thus, in a simulation, undergraduate students can test their capacity to express their ideas openly in the target language. A simulation represents a valuable means of engaging in a formative evaluation as students' current and previous knowledge of grammar and vocabulary can be assessed at once. In addition, in a simulation, learners are encouraged to engage in self-assessment and shared assessment (Angelini, 2016; Klabbers, 2009) which develops their metacognitive skills. Thus, pre-service teacher students are provided with valuable didactic input related to assessment practices. Foreign language learning can trigger an increased level of anxiety in students. Because simulations comprise hypothetical situations, students feel less pressure as compared to a real situation (Garcia-Carbonell & Watts, 2010, p. 3). Therefore, another reason to use simulation refers to lowering students' anxiety levels in language learning (Angelini, 2021, p. 9).

The learning opportunities offered by simulations also regard the development of transversal skills (collaborative skills, intercultural communicative skills, etc.) and of pedagogical knowledge. In the case of pre-service teacher training, undergraduate students are faced with a simulation with an authentic communicative context that motivates them to "draw on interpersonal and problem-solving skills from their own experiences" (Qiu & Dunn, 1992, p. 136) and to provide multiple perspectives on topics related to didactics. The focal point of a simulation lies in the "complex model of communication and social relationships" (Garcia- Carbonell & Watts, 2010, p. 3) it creates.

Facilitating a strong relationship with one's students or among students taking part in an EFL classroom represents a salient aspect that can influence the success of a teaching-learning activity. Thus, by being engaged in simulation-based activities, pre-service teachers have hands-on experience on the potential of incorporating them into their own teaching.

According to Garcia-Carbonell and Watts (2010, p. 2), the use of simulation in language learning is guided by the following principles: it should be achievable by all those involved in the activity; it should have a communicative purpose; it should engage and motivate participants; it should provide exposure to different language areas and registers. Having in mind these principles and with the purpose to achieve professional development, pre-service teachers can be required to create a simulation-based activity with the focus being placed on their ability to identify appropriate teaching resources and tasks to suit both students' language level and their motivation. The high degree of adaptability that simulation-based activities offer makes them suitable for pre-service teacher training.

19.4 Incorporating Virtual Exchange in Teaching English Didactics

The educational value of virtual exchange projects has been widely discussed in the literature and in the previous chapters in this book (Dooly, 2011; Guth & Helm, 2012; Dooly & Sadler, 2013; Helm, 2016; O'Dowd, 2018; Angelini & Muñiz, 2021). According to O'Dowd (2018, p. 1), the term "virtual exchange" can be used to describe an online collaborative project integrated within an educational programme that aims to connect learners from different geographical locations or from diverse cultural backgrounds. In this respect, a virtual exchange programme that acknowledges the importance of participants' immersion in social contexts to provide valuable collaborative and interactive opportunities (Guth & Helm, 2012, pp. 42–43) also focuses on enhancing participants' intercultural communicative competence. As mentioned at the beginning of this chapter, pre-service teachers are required to develop themselves ICC to be able to equip their learners with the necessary intercultural knowledge, skills and attitudes. The unique combination of a multicultural and multilingual context coupled with authentic communication provides participants in a virtual exchange with the possibility to explore avenues for developing their intercultural communicative competence (Belz, 2007; Kramsch & Thorne, 2002).

A virtual exchange programme offers pre-service teachers a safe context for discussing with other participants' topics related to teaching methodologies, assessment practices or classroom management issues that characterise various teaching environments (Pop, 2021). Thus, undergraduate students' pedagogical content knowledge can be enhanced.

Helm (2014) and O'Dowd (2018) suggest that a virtual exchange project develops participants' digital skills as they need to make use of different learning apps and programmes to engage actively in discussions and to solve assignments.

Pre-service teachers enrolled in the course English Didactics at the Faculty of Letters, Babes-Bolyai University of Cluj-Napoca, were invited to take part in the Spring semester of 2021 in a virtual exchange and simulation project developed by Laura Angelini and Rut Muñiz-Calderon from the Catholic University of Valencia. The project aimed to contribute to pre-service teachers' professional development to enhance their digital skills and develop their intercultural communicative competence. A Google Forms questionnaire was the main research instrument employed to gather data on these three directions. The findings indicate that due to the use of simulation-based activities respondents from Babes-Bolyai University of Cluj-Napoca have developed their pedagogical knowledge to a high (43%) and remarkably high (57%) degree (Pop, 2021). Intercultural communicative competence was developed to a high degree by 36% of the respondents and to a very high degree by 64% of the respondents.

Additionally, respondents had to be knowledgeable of etiquette rules and of conducting efficient communication in a multicultural environment. Because all communication in the virtual exchange programme was conducted in English, we can state that language skills also represented an outcome of the project. As digital skills are concerned, respondents indicate that by the end of the project they have developed their digital competence to a high degree (28.6%) or to a very high degree (35.7%) (Pop, 2021). Consequently, the virtual exchange and simulation project organised by the Catholic University of Valencia was valuable and relevant for pre-service teachers at the Faculty of Letters because it developed, to varying degrees, their pedagogical knowledge, intercultural communicative competence and digital skills.

19.5 Conclusions

Various empirical studies endorse the efficiency and relevance of integrating simulation-based activities into the teaching of a foreign language with the aim to develop students' language skills. Additionally, this chapter indicated that simulations can be used efficiently in pre-service teacher training programmes with the purpose to develop undergraduate students' intercultural communicative competence and pedagogical knowledge. In a similar way, virtual exchange projects offer a unique combination of a multicultural and multilingual context coupled with authentic communication.

19.6 Summary

To promote inclusive and culturally responsive teaching, teacher training programmes should be infused with an intercultural perspective that acknowledges the need to develop prospective teachers' intercultural communicative competence in addition to subject matter knowledge and pedagogical knowledge. This chapter identifies the didactic potential of simulation-based activities and virtual exchange projects to develop undergraduate students' language skills, intercultural communicative competence, digital skills and pedagogical knowledge. The perspective offered in this chapter has mainly focused on the Romanian educational context, more specifically the higher education level. The interest in infusing an intercultural perspective in pre-service teacher training in Romania has increased steadily in the past decade.

References

Angelini, M. L. (2012). *La simulación y juego en el desarrollo de las destrezas de producción en lengua inglesa* (Doctoral dissertation, Universitat Politècnica de València).

Angelini, M. L. (2016). Estudio sobre la evaluación formativa y compartida en la formación docente en inglés. *Actualidades Investigativas En Educación, 16*(1), 282–303.

Angelini, M. L., & García-Carbonell, A. (2019a). Developing English speaking skills through simulation-based instruction. *English Language Teaching, 19*(2), 3–20.

Angelini, M. L., & García-Carbonell, A. (2019b). Enhancing students' written production in English through flipped lessons and simulations. *International Journal of Educational Technology in Higher Education, 16*(2), 1–19. https://doi.org/10.1186/s41239-019-0131-8

Angelini, M. L. (2021). *Learning Through Simulations: Ideas for Educational Practitioners*. Switzerland: Springer Nature

Angelini, M. L., & Muñiz, R. (2021). La simulación a través de intercambios virtuales en la formación de profesorado. *Edutec. Revista Electrónica De Tecnología Educativa*, (75), 65–89. https://doi.org/10.21556/edutec.2021.75.1913

Ayudhya, P. (2015). Effectiveness of Simulation in Developing English Communicative Speaking Skill in Learners with Different English Proficiency. *Journal of Simulation/gaming for Learning and Development, 1*(1), 22–33.

Bârlogeanu, L. (2005). *Intercultura*l *Education*. MEC Publishing House.

Belz, J. A. (2007). The Development of Intercultural Communicative Competence in Telecollaborative Partnerships. In R. O'Dowd (Ed.), *Online intercultural exchange*, pp. 127.

Byram, M. (2009). Intercultural competence in foreign languages: The intercultural speaker and the pedagogy of foreign language education. In D. Deardorff (Ed.), *The Sage Handbook of Intercultural Competence* (pp. 321–332). Sage Publications.

Byram, M. (1989). *Cultural studies in foreign language education*. Multilingual Matters.

Cosma, M., & Cosma, B. O. (2006). *Intercultural Education: From theory to practice*. Lucian Blaga University Publishing House.

Collie, J., & Slater, S. (1997). *Literature in the Language Classroom. A resource book for ideas and activities*. Cambridge University Press.

Vlădescu, I. (2011). Intercultural education as a reflection of intercultural principles in school. *Educatia* 21, (9), 1–13.

Choudhary, Z. J. (2013). An Investigation of Effectiveness of Simulation in Developing Oral Skills: A Case Study. *European Scientific Journal*, vol. 9(32), 254–270. https://doi.org/10.19044/esj.2013.v9n32p%25p.

Cucoş, C. (2000). *Education*. Polirom Publishing House.
Deardorff, K. D. (2006). Identification and assessment of intercultural competence as a student outcome of internalization. *Journal of Studies in International Education, 10*(3), 241–266.
Dooly, M., & Sadler, R. (2013). Filling in the Gaps: Linking Theory and Practice through Telecollaboration in Teacher Education. *ReCALL, 25*(1), 4–29. https://doi.org/10.1017/S0958344012000237
Dooly, M. (2011). Crossing the Intercultural Borders into 3rd Space Culture(s): Implications for Teacher Education in the Twenty-First Century. *Language & Intercultural Communication, 11*(4), 319–337.
Guth, S., & Helm, F. (2012). Developing Multiliteracies in ELT through Telecollaboration. *ELT Journal,* 66(1), 42–51. https://doi.org/10.1093/ELT/CCR027.
Garcia-Carbonell, A., Rising, B., Montero, B., & Watts, F. (2001). Simulation/gaming and the acquisition of communicative competence in another language. *Simulation & Gaming, 32*(4), 481–491. https://doi.org/10.1177/104687810103200405
Hardianty, N., & Mukrim, N. (2013). Improving Speaking Skill Through the Use of Simulation Technique. *E-Journal of English Language Teaching Society (ELTS), 1*(2), 1–10.
Helm, F. (2016). Facilitated Dialogue in Online Intercultural Exchange. In R. O'Dowd & T. Lewis (Eds.), *Online intercultural exchange: Policy, pedagogy, practice* (pp. 150–172). Routledge.
Helm, F. (2014). Developing Digital Literacies Through Virtual Exchange. *E-Learning Papers, 38*, 1–10.
Klabbers, J. H. (2009). *The magic circle: Principles of gaming and simulation*. Sense Publishers.
Kramsch, C., & Thorne, S. (2002). Foreign Language Learning as Global Communicative Practice. In D. Block & D. Cameron (Eds.), *Language learning and teaching in the age of globalization* (pp. 83–100). Routledge.
Kramsch, C. (1998). *Language and Culture*. Oxford University Press.
Liddicoat, A. J., & Scarino, A. (2013). *Intercultural language teaching and learning*. Wiley-Blackwell.
O'Dowd, R. (2018). From telecollaboration to virtual exchange: state-of-the-art and the role of UNICollaboration in moving forward. *Journal of Virtual Exchange*, 1, 1–23. https://doi.org/10.14705/RPNET.2018.JVE.1
Pop, R. (2021). Pre-service Teachers' Hands-on Experience with a Virtual Exchange and Simulation Project. *An Introduction to Internet Linguistics*, 81.
Pop, R. (2019). An Intercultural Perspective in Teaching the Didactics of the English Language. In D. Cotrau, A. Cotoc & O. Papuc (Eds.), *An introduction to internet linguistics: The cultural sociolinguistic take with case studies* (pp. 81–96). Presa Universitara Clujeana Publishing Press.
Pop, R. (2018). An Intercultural Turn in the Pre-Service Teacher Training. A Perspective on the English Language Teaching. *Studia UBB Psychologia-Paedagogia, 2*, 93–107.
Pop, R. (2015). *Modelarea competenței comunicative interculturale a studenților. Aplicații pentru formarea inițială la specializarea engleză*. Casa Cărții de Știință Publishing House.
Qiu, Z., & Dunn, J. V. (1992). Simulation/Gaming for Language Learning in China. In D. Crookall & K. Arai (Eds.). *Global Interdependence. Simulation and Gaming Perspectives*. London: Springer.
Sercu, L., Bandura, E., Castro, P., Davcheva, L., Laskaridou, C., Lundgren, U., Del Carmen Méndez García, M., & Pet, R. (2005). *Foreign Language Teachers and Intercultural Competence. An International Investigation*. Romania: Multilingual Matters Ltd.
Taguchi, N. (2012). *Context, Individual Differences and Pragmatic Competence*. Multilingual Matters.
Tomlinson, B., & Masuhara, H. (2000). Using simulations on materials development courses. *Simulation & Gaming*, 31(2),152–168. https://doi.org/10.1177/104687810003100202.
Wood, K. (2009). Pre-service teachers' experiences in teacher education: What we taught and what they learned about equitable education. In H. R. Milner (Ed.), *Diversity and Education: Teachers, Teaching and Teacher Education* (pp. 163–174). Charles C Thomas Publisher Ltd.

Web References

Common European Framework of Reference for Learning Foreign Languages (CEFR), (2001), Language Policy Unit, Strasbourg. Retrieved November 23, 2021 from https://rm.coe.int/16802fc1bf.

European Commission (2018). Proposal for a Council Recommendation on Key Competences for Lifelong Learning. Brussels. Retrieved December 2, 2021 from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0014&from=EN

European Commission. (2015). Strengthening teaching in Europe: New evidence from teachers compiled by Eurydice and CRELL. Luxembourg: Office for Official Publications of the European Communities. Retrieved December 20, 2021 from http://ec.europa.eu/assets/eac/education/library/policy/teaching-profession-practices_en.pdf

The European Profiling Grid (EPG), Retrieved November 24, 2021 from https://egrid.epg-project.eu/en/egrid

The Romanian Ministry of Education, The school curriculum for English, secondary level (2017). Retrieved November 24, 2021 from, http://programe.ise.ro/Portals/1/Curriculum/2017-progr/19-Limba%20moderna1.pdf

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Part IV
Simulation Samples

General Guidelines and Simulation Template

20

M. Laura Angelini

Overview

This chapter attempts to guide the practitioner through the application of simulations, either classroom simulations or virtual simulations. A template is provided for practitioners who might like to venture to develop more. Facilitation notes are provided. In addition, this chapter presents 7 complete simulations which have been designed by specialists in teacher training, law, and medicine. Each simulation consists of a scenario, goals, profiles' descriptions, and debriefing questions. Some explanatory notes and facilitator's notes are offered in some to facilitate their application. The number of participants per team and the allotted time is approximate. Each practitioner should adapt the simulations according to specific needs and time restrictions.

Keywords

Simulation · Simulation scenarios · Teacher training · Briefing · Debriefing

Learning Objectives

This chapter should allow the reader to

- read and analyse clear simulation samples with their scenarios, objectives, profiles, and debriefing questions;
- use a template to create simulations.

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1. Introduction

It is important, at this point, to remind the reader/practitioner that all the suggested simulations are fictional although elements from real life have been introduced in an attempt to bridge the gap between reality and fiction.

Another relevant aspect is that participants will find themselves entering these simulations without knowing what to expect from the other members. It is not feasible to construct simulations that exactly mirror each of the participants' circumstances. These simulations have not been designed to place each of the participants in a deficit position from the very beginning. All the profiles provide the necessary information that would allow the participants to understand their responsibilities in the simulation. However, participants should do some research about the theme or themes tackled in the simulation to be able to justify their responses during the action phase.

The background and contextual information do not script or direct the interactions, decisions, or verbalizations in the simulations. In fact, what the participants say, do, and decide is up to them.

As suggested before, it may be necessary to provide some general guidelines before using any of these simulations. As the facilitator, you may need to bring your students/participants together for some prior sessions. It is imperative for them to get used to working in teams, to learn the dynamics of turn-taking and decision-making, and to trust each other. Some games or classroom techniques can help with this (Angelini, 2021). Bear in mind that simulation is responsive to authentic learning if mainly applied cyclically and iteratively (Angelini & Diamanti, 2023 in press).

Post-simulation dynamics consists of debriefing questions protocol and is usually guided by the facilitator. It is recommendable to answer the questions right after the simulation action is over. These questions are intended to identify participants' perceptions of the whole proposal, the problems addressed, team work decisions, and learning out of the experience. The goal of each simulation is to engage participants in a variety of worry-free situations that emerge from educational environments, and through them develop critical thinking. They may also serve to anticipate reactions, possible concerns, and decisions that in reality are to be made at the spur of the moment. The facilitator needs to clearly understand the simulation and their role during the action phase. For example, some participants may be tempted to ask for some clarifications during the simulation action phase. It is precisely here that the facilitator should adopt a specific role to avoid distractions of the participants. The facilitator is no longer a teacher, but an observer that may interact occasionally if strictly necessary (the facilitator has to intervene if any of the participants or teams move away from the role or goal of the simulation).

To round off, each simulation is an approximation to an educational reality and everyone participating in it should act accordingly.

Each simulation indicates the following:

- simulation name;
- recommended number of team members;
- type of participants;
- allotted time;

- simulation scenario (briefing information);
- general goal;
- profiles and individual goals;
- debriefing proposals process.

2. Facilitation notes

All participants should be provided with a profile sheet each (simulation scenario).

The parties must negotiate an innovative strategy so that they analyse different points of view with sound arguments.

Allow group members 20–30 min to read over their briefing and profile sheets and become familiar with the roles. This is estimate time and facilitators may consider changing the allotted time according to the complexity of the scenario or the participants' needs. Clarify any questions before beginning the exercise. Tell each group to begin by having participants introduce themselves and their roles. Remind participants about their background and objective/s.

> *Facilitators must not intervene with the participants. Exceptionally, the facilitator will adopt a role. E.g.: Committee Advisor*

Notes must be taken to elaborate a complete report (including bibliographic references to support the improvements). The report is thought to consolidate learning and functions as a metacognitive strategy. It can also be used as an assessment tool.

All members must try to agree on the decisions (i.e., a consensus). If multiple groups are run simultaneously and the situation is recorded to assess the participants' performance later, it is advisable to hold the sessions in separate rooms to ensure a clear sound and to avoid the different groups from influencing one another.

3. Template

In order to design a simulation, first decide on the following:

- **Theme**: Think of the topic you would like to delve into. For example, simulations can be used to complement the treatment of literature. Identify the themes of the book or film your students are studying.
- **Learning Outcomes**: List the learning outcomes—what you would like your students to learn to do/develop/assimilate.
- **Scenario**: Build the simulation scenario based on the themes chosen and make sure you clearly state the problems. Simulation scenarios must have problems to be solved. Thustifies the debate, negotiations, and decision-making.
- **Team-making**: 4–6 members per team.
- **Resources**: Make sure you have the briefing sheets for each participant, their profiles, and a comfortable room. Even 2 rooms may be necessary to prevent the place from being too noisy. Participants will speak loudly. For assessment purposes, you may decide to record the simulation.
- **Facilitator's role**: Monitor the teams, that is, take active notes of the interaction and language restraints without interfering in the action. In some cases, for

clarifications, the facilitator adopts a profile as well (the pedagogical advisor, the psychologist, and so on).

- **Debriefing**: Make sure you have planned the debriefing discussion in advance. It could be done intra-teams or inter-teams (whole-class reflection).

Here is a template to create your own simulation:

Simulation Template

Simulation name:	**Suitable for:**
Allotted time:	**Nº Participants**
Language:	**Level:**
Simulation based on (piece of literature/film/other):	
Simulation scenario (briefing):	
General objective:	
Profiles + individual goals Profile 1+goals Profile 2+goals Profile 3+goals Profile 4+goals Profile 5+goals	
Debriefing procedure/questions:	

References

Angelini, M. L. (2021). *Learning through simulations: Ideas for educational practitioners*. Springer Nature.

Angelini, M. L., & Diamanti, R. (2023 in press). Simulation-based research for authentic learning in teacher training. *Educational Assessment, Evaluation and Accountability*.

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Sample 1: Simulation EUCO-ES Project

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M. Laura Angelini

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: University teachers and university administrators.
3. **Time allotted: Background study**: 30 min; Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: To learn and reflect about

- the impact of decisions in higher education;
- individual and group interests;
- institutional policies in favour of internationalisation.

Sociolinguistic approach:

- social and language abilities to debate, negotiate, and make decisions in higher education;
- simple and some advanced grammatical forms;
- pronunciation at the segmental and suprasegmental levels;
- the wide range of vocabulary used when speaking on a specific topic;
- language fluency.

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5. **Briefing sheet**

EUCO-ES Project

European University Consortium. Expertise Share

The University of Turku and your university will carry out an inter-scholar collaboration programme to start next term and for a period of 3 years. This project is part of the European Universities Initiative Programme, which advocates the establishment of links between universities with a long tradition in project development (UTU) in order to strengthen other developing universities like yours.

> ... to strengthen strategic partnerships between higher education institutions across the EU and to promote the establishment of 20 'European Universities', which would be bottom-up networks of universities across the EU, enabling students to graduate by combining periods of study in several EU countries and contributing to the international competitiveness of European universities.

In its pilot phase, the project will involve adaptations and strategic changes in the areas of psychology, languages, physical education, artistic expression, and law in both institutions. At your university, the faculties that will initiate this collaboration will be the Faculty of Psychology, the Faculty of Teaching, and the Faculty of Law. The selected departments are Department of Psychology; Department of English; Department of Art, Music, and Physical Education; and Department of Law and Criminology.

> We aim at creating a network of academics that re-signify the internationalisation of the institutions. We will provide support and facilitate teachers, scientists, and students the best access to all the facilities to receive training and develop research in the campuses of the network.

This project seeks to provide a degree where a compact living-learning model is explored that also integrates and optimises existing training and practice at each institution. It aims to provide opportunities for learning and research.

The project offers an exchange programme that encourages mobility between the two universities for the benefit of faculty and students.

The initiative builds on successful projects such as MIT partnering with the Singapore University of Technology and Design (SUTD). Together they were able to instil a start-up mentality that MIT could not easily apply in the United States. MIT was able to demonstrate how experimental pedagogical ideas work in practice, while SUTD offered cutting-edge educational experiences to its students. A staff exchange programme encourages cross-pollination between the two universities by allowing faculty and students to access other contexts and expand their learning.

The International Association of Universities (IAU) supports these initiatives and is committed to recognising academics who join in the project proposed here, and UTU is a senior institution with more than 20 years of experience in university collaboration programmes. Your university, having less experience in exchange programmes, has to respond to the following challenges:

a. To guarantee flexibility in the timetable of the teaching staff both face-to-face with foreign students and online as guest lecturers in Turku;
b. Reassigning credits and subjects to qualified teachers;
c. Establish contact with parallel teaching staff at the other institution;
d. Design a mobility proposal for teaching staff with a stay of between 4 weeks and 4 months at the host university;
e. Offer a research mobility to lecturers from each degree programme who have the merits to establish themselves at the host university with all expenses covered;
f. Carry out a scale of academic merits to guarantee the appropriate allocation of credits and benefits of the project.

General objective:

To effectively address the challenges posed by the EUCO-ES Project within your institution, the Steering Committee should (a) be able to design a scale of academic merit that guarantees adequate participation and appropriate acknowledgements to those who participate in a committed and responsible manner; (b) carry out a justified pre-selection of teaching-researcher participants.

EUCO-ES Steering Committee

1. Project Director.
2. Academic Coordinator.
3. Finance Coordinator.
4. Faculty Coordinator A (x2).
5. Faculty Coordinator B (x2).

General goal:

To effectively address the challenges posed by the EUCO-ES Project within your institution in order to

(a) be able to design a scale of academic merits that guarantees adequate participation and the appropriate recognition of its members;
(b) to carry out a justified pre-selection of teaching-researcher participants.

Profiles

Profile 1 Project Director

As director of this project, you must know the reality of the faculty in each department involved, the infrastructure, and the most compatible curricula to develop it.

- You must ensure that deadlines are met, and the project is completed.
- You will receive compensation through a reduction of 120 h of your base lecturing dedication to direct and supervise the project.

- You must act as a binding link between the institutions and as a motivating agent to build accountability, commitment, and confidence in the success of the project.
- You must handle pressure to make immediate and medium-term decisions.
- You must foster participation in decision-making.
- You must show determination to establish correct procedures, without overburdening lecturers, while demanding accountability and demonstrating transparency throughout the process.
- You must delegate university/ departmental/ curricular responsibilities to faculty academics based on levels of interest and expertise.
- Reassign lecturing hours and subjects to qualified faculty academics.
- Design a mobility proposal for faculty with a stay of 4 weeks to 4 months at the host university.
- You must justify the measures adopted in any case.

Profile 2 Academic Coordinator

You have been selected by the Chancellor of your university to assume this position. You have experience in university management and more than 10 years in the present institution. You have a fairly fluid dialogue with most of the lecturers you work with in your faculty. Your responsibilities include the following:

- Identify qualified faculty academics to take on subjects linked to the project.
- Design merits criteria agreed upon by the project team.
- Resolve the situation of a number of faculty members with academic merits and years of experience in the institution whose commitment to innovative actions has diminished.
- Carefully consider possible reasons for requesting not to participate in the project at the expense of the loss of opportunities for students.
- Ensure flexibility of the teaching staff's timetable to teach face-to-face with foreign students and online as a visiting professor in Turku.
- Offer research mobility to lecturers from each degree programme who have the merits to establish themselves at the host university with all expenses covered.
- Invest the right amount of your attention to motivate lecturers, despite their perceived reluctance.

Profile 3 Finance Coordinator

The Chancellor of your university is counting on you to assume this position. You should develop and approve a budget that provides equitable funding. The project is funded on a tripartite basis between the EU, UTU, and your university. The EU has a total grant of €120,000 to cover the costs of mobility and dissemination of good practice for the development of the project, to be shared between the two institutions. The internal costs derived from the project are assumed by each university regardless of criteria (remuneration of participants and events).

You must indicate that your university will not consider a reduction of lecturing hours for the participating professors, as indicated by your Chancellor. It is up to you to justify this decision and to encourage the lecturers to participate. You are aware of the contractual situation of the teaching staff and consider that the project is perfectly compatible with the workload, dedication, and hours established in their contracts.

Your job is to perform the following:

- Develop and approve a budget that provides equitable funding.
- Discover the specific needs of students and teachers who are hosted at your university (incoming); those who are staying at UTU (outgoing); and those who are undertaking virtual mobilities.
- Coordinate contact with parallel faculty at UTU.
- Identify specific needs and resolve requests for resources:
  - Personnel,
  - Consumables/consumable equipment,
  - Travel and subsistence expenses,
  - Subcontracting, and
  - Other direct costs.

You will have 40 h-reduction per month to comply with the project responsibilities. This is not sufficient recognition due to the workload compared to the reduction received by other coordinators with related functions.

Profile 4 (x2) Faculty Coordinator A

After many years in the institution, you are enthusiastic about participating. You have been active in your position as a teacher-researcher and your academic merits give accountability for this. Your initiatives have sometimes been implemented with some reluctance from colleagues and chiefs of faculty departments. You severely question some of the privileges enjoyed by some teachers such as better timetables, who could potentially have privileges under the project. You try to ensure that your ideas and concerns are considered in the organisational phase of the project.

- You should propose a team of committed teachers who can join you in the project.
- You should raise issues related to the development of the project:
  - Exclusive timetable for some teachers?
  - Limits on the number of foreign students in the classroom?
  - Project compensation?
  - Seniority preferences?
  - Co-teaching with UTU faculty lecturers?
  - Availability for stay at UTU?
  - Others?

Profile 5 (x2) Faculty Coordinator B

After many years at the institution, you perceive some pressure to participate in the Steering Committee. You have an affable relationship with your dean who has expressly urged you to participate.

You enjoy teaching and participating in conferences once or twice a year. You are a good teacher, and your students recognise this. However, you are not motivated to join the project for fear of missing out on certain benefits such as the same subjects every year, a fixed timetable 4 days a week from 8:00 to 12:00, a location close to your home, and no foreign students with needs.

The subjects you teach are of interest to the project. You have to negotiate agreements because you are reluctant to give up your current situation. You and other teachers in your department in the same situation may be affected.

You have no family burdens that would make it difficult for you to participate.

6. Debriefing

Some debriefing questions can be presented in the form of a 1–4 Likert-scale or questionnaire and a final open question:

	1	2	3	4
1. The scenario was appropriate to my experience and expertise.				
2. Our team responded satisfactorily to the scenario.				
3. The simulation was realistic.				
4. I changed my views during the discussion.				
5. I felt able to solve the challenges and problems.				
6. I felt confident in my participation in the simulation.				
7. I prioritised my scetors objectives.				
8. I gave priority to my personal interests.				
9. I felt motivated during the simulation.				
10. I understand the potential of the simulation for my subjects.				
11. I fell that I could use simulations in my classes.				
12. I have that I could use simulations in my classes.				
13. General commants.				

Another alternative for the debriefing could be a set of questions to discuss with the group as a whole:

1. What do you think of EUCO-ES scenario?
2. Comment on the results of your team's interventions.
3. To what extent have you observed changes in your understanding of the topic?
4. From the simulation, how would you be able to solve similar challenges?
5. How did you feel in your profile and why do you think you felt this way?
6. Would you have liked to play another profile within the simulation? Why?
7. What difficulties have you encountered in performing your profile?

8. To what extent have your personal interests interfered with the objectives of your sector?
9. What potential/future do you see for simulation in your own learning or training for your future professional life?

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Sample 2: The School of Valtance (Version 2)

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M. Laura Angelini

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: University teachers and university administrators.
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: To learn and reflect about

- the impact of decisions in primary and secondary school;
- analysis of individual and group interests;
- institutional policies in favor of active methodologies, special education, internationalization, and co-teaching.

Sociolinguistic approach:

- to develop social and language abilities to debate, negotiate, and make decisions in higher education;
- to control simple and some advanced grammatical forms;
- to improve pronunciation at the segmental and suprasegmental levels;
- to manage a wide range of vocabulary when speaking on a specific topic;
- to produce extended stretches of appropriate language fluently.

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5. **Briefing Sheet**

The School of Valtance (Version 2)

At the School of Valtance, we take our responsibility seriously in order to prepare students for life in the twenty-first century. The acquisition of fundamental values lies at the heart of everything we do, and all areas of the curriculum are a vehicle for underpinning these values.

The school aims to expose every student, every day, to experiences that will help them understand the need for mutual respect, tolerance, and understanding of people from different cultures. We pride ourselves on our success in this area as we see our students embrace the difference with respect and integrity.

In order to achieve our values and goals, the School of Valtance will

- maintain a school culture of excellence in teaching, student achievement, innovation, and self-advancement;
- maintain a supportive, healthy, and secure environment for teaching and learning;
- utilize technology and innovative pedagogy to advance student learning;
- raise student awareness and engagement in social, environmental, and inter-cultural activities, both within and outside the academic programs of study;
- provide excellent facilities and resources to support the programs of study, minimizing negative environmental impact;
- recruit, develop, and retain teachers and support staff, who inspire students, contribute to the professional learning community, and are positive role models for our students;
- maintain stable and effective governance focused on financial soundness, operational efficiency, and the long-term advancement of the school;
- engage parents, alumni, and the local and wider community in support of the school.

> *There is a friendly, almost village-school atmosphere. The pupils are well-spoken, well-behaved and treat each other nicely.*

Secondary School

Secondary School programs of study build on the firm foundations established in the Primary School and begin to prepare students for secondary education. All programs of study center around PBL (Project-based learning) guiding questions that open up and develop thinking skills, subject knowledge, concepts, and ideas. Technology is rapidly changing in our world, and secondary students should develop a good command of technological devices as a tool for learning.

The School of Valtance will be part of a consortium and will share the same principles. The School of Valtance has been providing accessible education for more than a decade now. However, several issues still must be discussed and improved.

An elected Committee meets three times a year to discuss and share information pertaining to the whole school. This term, the Committee is meeting to deal with some inquiries presented to the Head of the School. This Committee is made up of the following people:

- Head of the School of Valtance.
- ValPE, member of the Valtance Pedagogical Advisory Board.
- ValPAR, member of the Valtance Parent Association.
- ValED, member of the Valtance English Department (x2).
- SerVal: member of Service Learning Department.
- SpEd: member of Valtance Special Education Department.

The inquiries and requests for clarification are classified into the following:

1. Teaching methodologies in ESL-language teaching/skills.
2. Classroom management.
3. Shared teaching through lesson study.
4. Literature, storytelling, and drama in English.
5. Multiple modalities in teaching and assessing.
6. Crisis management: coping with crisis, online teaching (COVID-19, …).

Inquiries and requests for clarification

A. ***Active methodologies in ESL-language teaching/skills/***

Innovation characterizes the School of Valtance. Teachers are annually trained in the latest methodologies and teaching resources. However, the school is finding it difficult to reach an agreement on which methodologies are actually the best ones for the different areas. It is true that educational practices, teaching methods, and curriculum vary from school to school; nevertheless, in the School of Valtance, there exists a basic concept of education. Students are required by law to attend an educational institution whose responsibility is to impart knowledge and understanding of the traditional subjects: mathematics, official languages, literature, social studies, and sciences. A certain level of non-traditional teaching style and subject emphasis has been tolerated but recently non-standard educational movements have become broad, such as flipped schools, project-based approaches, service learning, thinking-based learning, and other active methodologies.

The ValPE, the Valtance Pedagogical Board, has criticized the lack of consensus as the students seem not to understand how to proceed in class and at home.

As regards English teaching, the ValED, the Valtance English Department, finds it difficult to carry out a real L2 approach. They rely on the differentiation of language skills, and they assume they should develop more efficient techniques to address communicative lessons. By adopting the C-Wheel approach in which they take account of the whole individual, they are likely to be more effective and successful in their work as language teachers. However, ValPE experts have compared the C-Wheel to the CLIL 4Cs in the way that content, cognition,

communication, and culture are embedded in a whole range of considerations about the students' overall development and needs and would be very interested to know what ValED teachers think about this.

As for skills, ValPE wonders why 75% of the students consulted highlight listening and speaking as their biggest problems. Would it be partly because of the demands of listening and speaking and partly because of the way speaking is often taught and listening is not taught at times?

ValPE requires more specifications about the development of listening and speaking skills, and how they are both related. They sustain that it is important to plan and organize a listening lesson in order to support students and help them succeed at listening in English. How can teachers help these students develop their listening skills and identify where they need to improve?

As for speaking, classroom-based speaking practice seems not to prepare students for the real world. It usually consists of language practice activities (discussions, information-gap activities, etc.) or is used to practice a specific grammar point. Even worse, it does not teach language patterns for real interaction. So, what can ValED teachers do in the classroom to prepare students for real interaction?

Pronunciation is very often overridden. In line with developing speaking, how can pronunciation be improved and to some extent normalized?

Reading and writing can be especially hard for students. Can ValED consider a few approaches to making classroom reading more communicative? That is, by integrating reading with other skills, so that students can see its value.

Writing, unlike speaking, is not an ability people acquire naturally; even in our first language, it has to be taught. Unless L2 learners are explicitly taught how to write in the new language, their writing skills are likely to get left behind as their speaking progresses. But teaching writing is not just about grammar, spelling, or the mechanics of the Roman alphabet. Learners also need to be aware of and use the conventions of the genre in the new language.

What stages are ValED teachers going to follow to teach grammar, vocabulary, and writing?

B. ***Classroom management***

Ten formal complaints have been passed about the ineffective learning environment during English lessons. Students are talking while the teacher is talking, moving around the room freely, and not attending to instruction. ValPAR, the Valtance Parent Association, has required measures to control discipline and the management of the classes during the English lessons bearing in mind that teachers are sought to maintain order and to keep the group on task and moving ahead. How can ValED teachers anticipate when misbehaviors are likely to occur and be proactive to prevent them? Something to remember is that the most effective interventions must be subtle, brief, and almost private.

In addition, the teachers need to create a classroom environment with clear expectations and a welcoming tone. Classroom management should be integrated with classroom activities. Instruction must be engaging and ensure that students are

active learners. Teachers must create a positive classroom environment where students can take risks and do their best work.

ValED teachers are to specify the following:

Class rules, students' seating, eye contact, learning students' names, teacher talk, drawing attention, giving instruction, using pair and group-work, setting time limits, the tasks for early finishers, whole class feedback, and the use of the board (blackboard, whiteboard, and digital board), among others.

C. *Shared teaching through lesson study*

The School of Valtance has a solid commitment to teacher development. Research shows how teachers learn best in collaboration, while addressing classroom-specific issues in local education contexts, and ValPE recommends lesson study to be one ideal way to support collaborative teacher development.

They argue that it is very common to see two or more teachers within the same classroom, which is already ideal for professional collaboration. Students seem used to being observed while they are learning. However, ValPAR, the Valtance Parent Association, questions the presence of multiple teachers and practice teachers in the classrooms to just observe the learners, worrying that so many people inside a classroom may disturb some students with shorter attention spans. They are concerned that teachers have a hard enough time helping them focus on learning tasks and having multiple adults in the settings would be further distracting. ValPAR is asking for educators' reconsideration of the usefulness of shared teaching, arguing that students' learning needs should outweigh this particular form of professional development. On the contrary, the ValPE and the Head of the School have expressed stronger support for lesson study and are ready to step forward with their plans. How could they communicate the benefits of lesson study to concerned parents?

D. *Literature, storytelling, and drama in English*

Every year, the School of Valtance holds an annual "End of Year Course Ceremony", enacted by its secondary students. This year, the Department of English (ValED) has been nominated by the Head of the School of Valtance to organize the performance. They have decided to incorporate the literary work they are to perform into their programmed classes so as to provide the students with a better understanding of the work, and to be able to explore it in a deeper literary context—allowing for a deeper engagement with the text, and therefore the language itself.

The Valtance Pedagogical Advisory Board (ValPE) has said that they are willing to accept the inclusion of this project into the programmed schedule, as long as the ValED provides them with more information about the specific goals and learning objectives of the project, focusing largely on the linguistic aspects of language acquisition. Meanwhile, the ValED argues that the dramatization of texts in the EFL classroom serves more as a tool, focusing on learning through applying the learner's experience to the text through discussion and responses to the text's theme/topic, with a clearer focus on the students. Taking this information into consideration, an

agreement must be reached as to how best to impart these classes once the play is chosen, choosing specific aims and methodologies/techniques in order to accommodate everyone's needs (the Valtance Special Education—SpEd—must be involved in this decision also). The Head of the School of Valtance must then be informed of the name of the play, the theme and its relevance for the event, and any specific requirements or equipment that the ValED may need.

Considering the decisions made regarding these issues, the ValED must then also work with the ValPE in order to continue with the selected text or change to an appropriate text to study and then act out in class and then in the performance. As active participants in the organization and funding of the End of Year Course Ceremony performance, the Valtance Parents Association (ValPAR) must also be involved in this decision, and most members are arguing that it would be better to work with a well-known, canonical text, as these are texts that have endured the test of time and therefore will have important information to impart both morally and culturally. However, the ValED states that there are more important factors to consider when choosing a text to study as part of learning a second language, viewing literature as more of a relative entity, and argue that students should be presented with a text that they can better relate to, such as an adaptation of the original, or a more modern text which uses more direct and straightforward language. A decision will need to be made and then presented to the Head of the School of Valtance, who will need to approve it.

Finally, in order to justify the use of this project, the ValED will have to present the ValPE with the method of assessment that they will use when evaluating whether their students have met the previously discussed criteria. Together, these groups will have to decide on a method of assessment that is accessible to all students and that can help them to show what they have learnt. They must also involve the SpEd representative in order to ensure that all students' abilities are accounted for. Furthermore, in order to ensure that students are assessed fairly, a preliminary assessment must be carried out in order to evaluate the type of learners that are present in the classroom and therefore better understand each person's needs. For this to happen, the ValED and the ValPE must create a form of identifying these learner types before the project can begin.

E. ***Multiple Modalities in "Teaching and Assessment"***

At Valtance, we want to make sure we are reaching all our students and leveraging their strengths in the learning environment. However, we have some students who are struggling in the English classroom and some who seem to be bored because they already know the content. Our students are all working at a different pace and have different starting points. We need to vary the way we are teaching and offer choices for how our students learn and how they show what they know. How can we teach in multiple ways at the same time, so our students are all engaged in their learning? What can we do to give more instruction to our students who are struggling? Once we know what skills and knowledge we want the students to

learn, how can we vary the way we assess the students so they are showing that they learned? For example, if we want students to retell a story, we can have them write, record a video, create a movie poster, or draw a graphic representation of the story. How else can we vary instruction so students have choices for learning and assessment?

F. ***Crisis management: coping with crisis, online teaching (COVID-19)***

The paralyzing health crisis has put into question all the conventional teaching methods we used to employ at Valtance. It made us rethink our educational strategies with a special consideration of our students' interests. We are now in front of two challenges: ensuring good quality teaching and learning and protecting our students' health and our mental health going under such stressful situations. At Valtance, we choose to raise these challenges and accompany our students throughout their learning journey in these hard times.

We as teachers are trying to balance our teaching responsibilities with our family responsibilities and trying to stay safe and healthy. Despite the scarcity of solutions in such a critical situation, we can still think of effective ways to cope with the crisis. Online teaching is one of them. However, it is not an easy or obvious task. It requires a lot of preparation and logistics. We should therefore consider the right tools and methods to make our students benefit from online learning. To this end, we should urgently prepare our teachers by enrolling them in an online teaching training. At Valtance, we aim at providing a technological support team that is flexible and available to help with any issue that might arise so the teachers can feel backed up. It is essential to create a school-wide culture of technology integration, so no one is left behind. We equally intend to train our students on how to use the Valtance Moodle platform. Would the use of technologies in teaching, such as the TRELLO platform or LINKR platform, be good alternatives for the students and the teacher to publish their class news, productions, or shared documents? Could they be used as a blogging space where creativity is promoted? Students may appreciate this technology simply because it reminds them of social media.

Would digital field trips be another way to make our students discover new places and monuments despite the lockdown? Would they be able to develop their writing and speaking skills? Teachers are called to think of other technologies to help their students throughout the crisis. By setting a strategy for the current situation, we are laying a sound and permanent crisis management policy.

Profiles

Profile 1. Head of the School of Valtance

The Head of the School of Valtance must analyze the weaknesses in the approach to teaching and learning, and the sanitary crisis among other issues that need a sound solution. Thus, the Head must draw on the experts at school in terms of English teaching and methodology, pedagogy, and educational community managers in order to satisfy the needs of each part, guaranteeing high-quality standards.

The Head of the School of Valtance rules an institution that places the wellbeing of its students and the interests of the community at the heart of everything the school does. His/Her mission along with the school is of, Enjoyment, Aspiration, and Achievement where students thrive in a nurturing yet challenging environment.

Lately, the Head of the School of Valtance has received numerous complaints and inquiries about certain measures and decisions taken by the ValED, the Valtance English Department. An important factor is that the Head of the School of Valtance is a linguist and has taught English as a foreign language for more than 15 years before becoming the Head of this school.

Profile 2. Valtance Pedagogical Advisory Board (VALPE)

ValPE, the Valtance Pedagogical Advisory Board, must analyze different aspects concerning English teaching in light of the several complaints received by students, students' parents, and some teachers who require more guidance. ValPE, together with the School Committee, must urgently come up to sound solutions.

ValPE, the Valtance Pedagogical Advisory Board, provides a range of services to the school and community in support of instructional activities that impact student achievement and success. ValPE assists the school by providing

- support and guidance in the implementation of active learning methodologies;
- training and support for teachers and principals in effective instructional strategies and models via workshops, symposiums, and other professional activities; support to teachers in the development of learning and evaluation situations that can be used in the classroom; examples of effective technology integration in the curriculum that enhance student learning;
- help in the writing of lesson plans, lesson studies, standards and procedures, professional development project proposals, and other projects.

These coming weeks are extremely demanding as they have to prepare "the Standards for Students Learning and Practice" to be presented to the Council for Education Accreditation. Unfortunately, ValPE has been overwhelmed with several complaints regarding methodological aspects in the English classes. Now, an urgent meeting must shed light on these aspects; otherwise, ValPE may not be able to finish "the Standards…" on time. They have already taken too long in the initial draft. Time is tight.

Profile 3. Valtance Parent Association (VALPAR)

ValPAR, the Valtance Parent Association, has detected abnormalities in behavior during the English lessons that hinder students from learning more effectively. ValPAR has to elucidate the core problems and help find a reasonable solution.

ValPAR, the Valtance Parent Association, is the structure through which parents/guardians in the school can work together for the best possible education for the learners.

ValPAR can advise the Head of the School and the School Committee on policy issues and incidents that may require a review of school policy, e.g., Bullying, Safety, Homework, Enrollment, Behavioral problems, etc.

ValPAR is a support for parents in the school.

ValPAR can invite experts to address the issues which are topical or relevant.

ValPAR is not a forum for complaints against either an individual teacher or parent. The Complaints Procedure is the mechanism for this. Unfortunately, ValPAR has resorted to the Complaints Procedure by meeting with the Head of the School and ValPE as students and some teachers from the English Department (ValED) have detected a sort of mild disagreement, and some may suggest "irritation" related to methodological and procedural choices.

The main representative of ValPAR is a teacher of English in another school in the region and the Head of Valtance School trusts her/him.

Profile 4. Valtance English Department (VALED)

ValED, the Valtance English Department, is dedicated to fostering student success by providing a solid exposure to the target language and maximizing intellectual potential in each individual within a nurturing yet academically challenging environment.

As a result of studying at the School of Valtance, students will communicate effectively, access information by various means, think critically, and solve problems in a timely manner. Students will successfully meet state standards and will attain the competences required through efficient organizational and time management skills. The rich educational experience provided by the English Department will produce children who will become active, fulfilled, positive, and resourceful young adults.

The great demands in today's society to have a good command of the English language has led ValED to design a proposal for quality education in English. Some uncertainties, though, have brought about a cascade of inquiries and complaints from several sectors that may jeopardize the ValED program. Action must seriously be taken to better clarify the different aspects under supervision. ValED representatives have enough experience in teaching English, and some are planning to apply for an international scholarship to better learn about other educational systems.

Profile 5. Service Learning Department (SERVAL)

Service learning is a more student-centered approach than other forms of community service, such as volunteering. The focus is on student experiences, and the entire service project is designed around providing as much education as possible. You know the benefits are reciprocal with service learning. Students *and* members of the community can both be equally satisfied. Among your initiatives, you want to establish Service Learning at the core of the school curriculum and to provide proposals for interventions that involve the students in community service in spite of the endless piles of curriculum to cover during the school year.

At Valtance, you are struggling hard to relate the activities and school projects with a service-learning approach. You feel very comfortable working with the ValED department as both agree on the virtues of service learning: communication

skills, self-awareness, and knowledge of community needs. However, the ValPE (Pedagogical Advisory Board) and SpEd (Special Education Department) require more specifications on your proposals as they seem not to be fully convinced with the methodology.

Profile 6. Special Education Department (SPED)

SpEd has concerns about the way the English department teaches students who need more support. The "one-way-fits-all" approach is not serving all students in the classroom, especially those who need more visuals and to be actively involved in their learning. Students with disabilities are capable of learning to high levels as long as they are receiving appropriate instruction.

SpEd collaborates with ValED, families, and the Head of school to create individualized goals for students with disabilities. They work together to determine appropriate accommodations and specialized instruction that will ensure that all students can master the English curriculum.

SpEd consults with the ValED on cases of struggling students or students who have off-task behaviors to creatively approach changes to instruction. They are experts on how to adapt instruction, so students have more opportunities to be actively involved in their own learning. They consider the pace of instruction, modalities used, tasks and activities, and assessments to ensure that all students can learn the content at a high level.

Students with disabilities are fully capable of learning the English content, but they need a creative teacher who can be flexible and make changes "on the fly". Many students with disabilities perceive the information in different ways than their classmates or teachers, so instruction has to value this "out of the box" thinking by welcoming multiple approaches to the material.

6. **Debriefing**

a. What do you think of the simulation School of Valtance?
b. Comment on your team's interventions. Was everyone actively involved?
c. Do you think you understand the issues tackled more after the simulation? Why is this so?
d. How would you be able to solve similar challenges from now on?
e. How did you feel in your profile and why do you think you felt that way?
f. Would you have liked to have another profile within the simulation? Why?
g. What difficulties did you encounter in carrying out your profile?
h. To what extent have your personal interests interfered with the objectives of your sector?
i. What potential do you see in simulation as a training strategy for your future professional life?

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Sample 3: Ground Rules

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Pilar Sellés Nohales and Maite Montagut Asunción

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: 1st–2nd undergraduate students of psychology.
3. **Time allotted**: Action: 60–90 min in 4 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: Participants will be able to

- analyse the characteristics that define a bullying situation and will design a school protocol to detect cases of bullying;
- make a reasoned proposal for intervention in the light of existing bullying programmes;
- justify the importance of an early approach to bullying, showing a "0 tolerance" attitude to any kind of violence at school;
- design school-wide prevention measures to prevent cyberbullying, considering empathy, playground play and inclusion, among others.

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Sociolinguistic approach:

- develop social and language abilities to debate, negotiate and make decisions in an educational environment;
- control simple and some advanced grammatical forms;
- improve pronunciation at the segmental and suprasegmental levels;
- manage a wide range of vocabulary when speaking on a specific topic;
- produce extended stretches of appropriate language fluently.

5. **Briefing Sheet**

Ground Rules

"Las Colinas" School is a local educational centre that offers Infant, Primary and Secondary education. All the pupils have known each other since kindergarten. As in every school, some misbehaviour has been observed and actions have been taken accordingly. Very recently, a teacher specialised in coexistence issues has been appointed to the school, and to the surprise of the teaching staff, she has found real cases of bullying among the pupils.

In addition to these findings, several students have manifested their discomfort with social networks and WhatsApp messaging. This has led to immediate action, being teachers and counsellors encouraged to receive special training on these issues.

At the moment, the school has two clear problems that need to be solved:

1. To determine bullying in a specific case.
2. To design a preventive measure to eliminate misbehaviours through technological tools and in person.

Description of the case

The two main protagonists, the child offender and the child victim, were friends. Their friendship had the approval of their parents. At this time, the child victim was very popular at school. The trouble between the two children started during a summer activity. From this moment on, the bully child started to conspire against the other child while still pretending to be a friend. Gradually, he surrounded himself with allies who were somewhat envious of the position of popularity that the victim had so far enjoyed. The latter's intellectual level was above average, and he excelled in mathematics, was an attractive boy and was very good at sports. The bully was a child with low impulse control and anger management problems. He felt no guilt when he was assaulted and identified hostility in the victim which helped him to justify his aggressive behaviour. He had a good self-concept as a fairly tall and strong boy.

Group bullying consisted of bullying actions both in and out of school. The bullying inside school took the form of humiliation, pushing, shoving, name-calling, teasing and isolation from play. Outside school, they manifested themselves in training sessions and matches and consisted of not passing him the

ball, not talking to him, laughing at him and, of course, not being invited to birthday parties. This went on for a whole school year. From being a very popular boy at school, he became an outcast. He responded timidly to aggression and never violently. He suffered from insomnia and was afraid to go to school in case he was attacked or isolated again.

The parents learn about this situation from another classmate and talk to their son. The child first denies it and is reluctant to accept that he is being hurt. Finally, he acknowledges it and manages to explain each of the humiliating actions and even names the perpetrators of the aggressions. The child justifies his silence so far by saying that he did not want his parents to worry. The parents go to talk to the school psychologist. The school knows nothing.

A school committee has been appointed to find a solution to the problem.

- Counsellor Psychologists (x2).
- Headteacher.
- Head of studies.
- Tutor.

General goals

- Define what constitutes a bullying situation and propose adjusted interventions.
- Justify the importance of an early approach to coexistence problems.
- Design prevention measures through a school protocol.

Profiles

Profile 1. Counsellor Psychologist 1

Counsellor Psychologist 1 is the secondary school counsellor. Feels overwhelmed by different issues to deal with apart from bullying. Believes priorities have to be established as academic issues are much more important than coexistence issues. He/She usually lessens the importance of some potential bullying cases by referring to them as "children's things". Points out that what happens nowadays with communication through technology (WhatsApp) is something very common and that it is not necessarily bullying. However, the psychologist comments that he/she is willing to participate actively to make the best decision that ensures coexistence in the school.

Goal: To reach a prompt solution in the simplest way possible, without forgetting that the interest is to improve coexistence.

Profile 2. Counsellor Psychologist 2

Counsellor Psychologist 2 is very committed to the issue. A relative has suffered from bullying and knows how devastating this could be for the victims. He/she will try to convince Psychologist 1 that these things are not just "kids' things" and that

they are just as important as academic issues. Counsellor Psychologist 2 strongly believes a systematic approach to bullying must be developed and implemented at school. Some structural changes may be necessary.

Goal: To make other professionals aware of the importance of making structural changes (in protocol, in teachers' attitudes and commitment and timetables, among others) in order to effectively tackle the problem.

Profile 3. Headmaster

The Headmaster is worried about the school's reputation and attempts to keep things unnoticed. However, he/she has a determination to eradicate bullying from school. Has realised that the teaching staff require further training and has organised a training programme to help them deal with, as well as prevent, bullying. He/she is also concerned about structural changes in the school and sees his/her position may be jeopardised.

Goal: To find quick solutions to the situation without it being reported in the media and without generating excessive concern among families.

Profile 4. Head of Studies

The Head of Studies focuses on the material and personnel resources that will be needed to implement intervention and bullying prevention measures. He/she is concerned about the costly measures that may come up after the meeting (changes in methodology, changes in space, changes in teachers' timetables and recruitment of more teachers, among others). Does not favour structural changes because they are time-consuming.

Goal: To solve the situation without entailing too much financial cost, and without having to undertake any specific training. He/she will give importance to raising awareness of bullying through school projects calling for empathy.

Profile 5. Tutor

The tutor is certain something bad is happening and wants to protect the student-victim. He/she is an experienced teacher and knows how to deal with such cases fairly well. He/she has an important dilemma as he/she knows the two-suspected students involved in the offence. He/she also knows their families.

Goal: He/she believes that both parties need help and will try to prevent the committee from siding with only one party.

6. **Debriefing**

1. What do you think about the situation that has occurred in Las Colinas School?
2. Comment on the conclusions reached by the Committee. State the proposals you have formulated to deal with the situation that has arisen.
3. To what extent have you noticed changes in your understanding of bullying?

4. To what extent have you noticed in yourself the change of opinion about the importance of being alert to any possible situation of bullying in order to intervene as early as possible?
5. How did you feel in your profile and why do you think you felt this way? Would you have liked to play another profile within the simulation? Why?
6. What difficulties did you encounter in carrying out your profile and defending your opinion?
7. To what extent have your personal interests interfered with the objectives of the committee?
8. How would you feel if you had to defend a position different from your own?
9. Based on how you saw yourself in this simulation and in this specific bullying situation, do you think you would be able to solve similar challenges? What competences have you acquired that could be useful in a real case of bullying?

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Sample 4: Northlence School

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Neus Álvarez and Chiara Tasso

1. **Team members**: 4–5 participants. Multiple teams can participate at the same time.
2. **Type of participants**: Teacher trainer students.
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: To learn and reflect about

- the impact of decisions in primary and secondary school;
- the impact of teacher's decisions in primary education;
- analysis of individual and group challenges related to ESL reading/writing;
- provide solutions to ESL reading/writing challenges based on research;
- benefits of applying research findings to teaching practice.

Sociolinguistic approach:

- develop social and language abilities to debate, negotiate and make decisions in higher education;
- control simple and some advanced grammatical forms;

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- improve pronunciation at the segmental and suprasegmental levels;
- manage a wide range of vocabulary when speaking on a specific topic;
- produce extended stretches of appropriate language fluently.

5. **Briefing Sheet**

Northlence School

The 'Northlence' school is an experimental private school which fosters innovation in education through research. Inspired by the principles of inquiry-based learning and inconstant seek of deep learning, the Northlence school is committed to the scientific method and research as a means to lead children and personnel to constant improvement. Moreover, the school has recently implemented a new linguistic policy in order to promote the acquisition of English. The new policy includes increasing the amount of English lessons to the maximum allowed by the national law, recruiting bilingual teachers and providing off-class opportunities to use the language by creating Only-English-allowed areas within the school premises (like the canteen and all corridors).

Therefore, the headmaster of this school community encourages the teaching staff to carry out action research to analyse their teaching-learning process and improve the quality of both students' and teachers' performance in the school. Annually, a particular area of study is prioritised, and this year, special attention has been given to reading-writing skills in ESL (L2) and its relationship with L1.

For this purpose, a specialised and diverse academic board has been created to deeply analyse the aforementioned topic. The board is made up of different specialised work teams which will be required to address one of the following educational challenges within the ELS reading/writing topic as they have been appointed as the school priority:

- Foster reading skills.
- Encourage reading both in L1 and L2.
- Improve reading comprehension.
- Minimise L2 interference in L1 literacy.
- Minimise L1 interference in L2 in ESL writing.
- Improve communication skills.
- Improve academic literacy.

Each work team will be required to research on a challenge given by the head teacher who will take into account their field of expertise. Each team will analyse the consequences and will provide possible solutions to the given challenges based on research with the aim of designing a practical proposal either for the class or for the whole school. This proposal will be shared at the final year staff meeting.

To that end, the headmaster calls the following staff members to gather and discuss about the different challenges, being their dialogue based on previous research:

a. Teacher of English as a Second Language.
b. Teacher of Therapeutic Pedagogy.
c. Generalist teacher and School Psychologist.
d. Generalist teacher who recently gained a B.A. in Pedagogy.

The following educational challenges have been appointed as the most urgent issues to be addressed:

- Foster reading skills.
- Encourage reading both in L1 and L2.
- Improve reading comprehension.
- Minimise L2 interference in L1 literacy.
- Minimise L1 interference in L2 in ESL writing.
- Improve communication skills.
- Improve academic literacy.

After analysing the given challenges, each group is requested to

DRAW up a report evidencing the research process and DESIGN a proposal for intervention in the classroom or school that, based on the research, will provide

a. solution or improvement to the problem analysed, or
b. guidelines for the achievement of the challenge posed.

Profiles

Profile 1. Teacher of English as a Second Language

You are a teacher with extensive experience in teaching all sorts of subjects and particularly English. Throughout your professional development, you have been a generalist teacher at different levels and, for the last 12 years, you have been teaching English at all levels of primary school (from 1st to 6th grade). You are passionate about your work, you are very committed to your educational work and you are concerned, above all, that your students learn. You are not against pedagogical innovation, but you're worried about the way it has been developed in recent years, where novelty takes precedence over the effectiveness, and everything that is labelled as new is received with a little critical spirit.

Your students value your classes and you as a teacher very positively.

Goal:

To solve the challenge/problem you are facing. You consider it to be of vital importance and you want the proposal to be based on well-founded, scientific evidence. You want to ensure student learning and insist that the assessment becomes an essential part of the intervention proposal.

Profile 2. Teacher of Therapeutic Pedagogy

You are a new teacher, but very committed to the fundamental role of education and to the school. You strongly believe in the values of EXCELLENCE school. In the school, there are not many children with special needs so you combine your work as a Therapeutic pedagogue with teaching in different classrooms and subjects. You are passionate about education; you regularly attend courses and try to be updated and you believe that pedagogical innovation is a must to be a good teacher. You are up to date with new methodologies and eager to be able to put them into practice.

Goal:

Solve the challenge/problem by applying new methodologies making Northlence School a reference in pedagogical leadership. You want to ensure equal opportunities for all pupils, addressing the special needs of those pupils who do not fit into the mainstream: those who require extra help and those who are particularly gifted. Similarly, Northlence has a scholarship programme for those pupils who are less well-off and you want to ensure that any innovation proposed is available to these pupils. Despite your limited experience, you have earned the respect and approval of your students, their parents and colleagues.

Profile 3. Generalist Teacher and School Psychologist

You are one of the initiators and a member of the board of trustees of the Excellent school. You are also in charge of the school psychologist's office and, although you have a teaching degree, you have not been working in the classroom for some years due to your other commitments at the school. You know almost every single student in the school and you also know the teaching staff well. You have leadership skills and you are good at managing conflict and helping find common ground. In addition, you have experience in educational research, and therefore, you are well aware of the benefits that proper research can bring to the pupils and teachers in the school.

Goal:

To solve the challenge/problem, your commitment to the school is undeniable: you have a professional and personal interest in leading the school to excellence. You are clear that this solution must meet the needs of each pupil, avoiding inequalities and adjusting to their way of learning. You want to avoid conflict among school staff by bringing everyone together and committing them to this common mission. You trust and know the value of the staff you have helped to recruit and train. You know that excellence is achieved through the search for continuous improvement: neither passivity nor 'trying for the sake of it' is going to help.

Profile 4. Generalist teacher who recently gained a B.A. in Pedagogy

You are a generalist teacher at the Northlence centre and you have just completed your studies in pedagogy out of personal interest. You enjoy learning and you like to contribute to the improvement of education from your job. You know that

sometimes you are too cautious when it comes to trying new things in the classroom and you value the effectiveness of your teaching. Your students consider you to be a good teacher.

Goal:

To solve the challenge/problem in such a way that the pedagogical basis for the proposal is evident. In addition, you would like to preserve the freedom of action of each teacher, as each teacher has his/her own pedagogical style.

6. **Debriefing**

1. What do you think of the Northlence scenario?
2. Comment on the results of your team's interventions.
3. To what extent have you observed changes in your understanding of the topic?
4. From the simulation, how would you be able to solve similar challenges?
5. How did you feel in your profile and why do you think you felt this way?
6. Would you have liked to play another profile within the simulation? Why?
7. What difficulties have you encountered in performing your profile?
8. To what extent have your personal interests interfered with the objectives of your sector?
9. What potential/future do you see for simulation in learning or training for your future professional life?
10. Could you add any other challenge, that you find relevant, to the given list?

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Sample 5: Dog Days

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Remedios Aguilar-Moya and Miguelina Cabral-Domínguez

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: University teaching staff from the Department of General Didactics, Theory of Education and Technological Innovation and the Department of Music, Plastic Arts and Physical Education. Level of English: B1 recommended (reading scientific literature, successful experiences in other countries, European educational legislation, etc.).
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: To learn and reflect about

- animal rights in the school environment as an influential socialisation agent;
- the importance of incorporating the figure of the dog as an enhancer of the pupils' integral education based on scientific evidence;
- generation of teaching–learning situations in Pre-school, Primary or Secondary Education, through which the expected learning results are achieved according to current educational legislation;
- professional teaching competence and the need for continuous training and lifelong learning in accordance with the demands of today's society.

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Sociolinguistic approach:

- to develop social and language abilities to debate, negotiate and make decisions regarding the incorporation of the figure of the dog in education.

1. **Briefing**

Dog Days

The welfare and preventive work of the figure of the dog in different areas is gaining more and more relevance as this animal is one of the most demanded by various characteristics: its cheerful and affectionate character or its ability to socialise quickly (Martos-Montes et al., 2015; López-Cepero Borrego et al., 2015; Maisón-Baibiene et al., 2020). It has been proved that dogs help motivate students and increase their levels of confidence (Brelsford et al., 2017; Reilly et al., 2020). This aspect has been echoed as suggested by a recent study by Martos-Montes et al. (2015) which shows a boom and expansion of the professional activity of the entities involved (institutions, companies, foundations, associations, etc.). These are systematically and continuously dedicated to various actions, with animal-assisted intervention (AAI) and animal-assisted education (AE), being their priority fields of action education, social integration, gerontology, psychology/psychiatry or neuro-rehabilitation.

For example, Benedito Monleón et al. (2017) found that the adoption of assistance dogs acted as an anxiolytic and positive stimulus during the hospitalisation of children as it reduced anxiety and improved the perception of possible future hospitalisations.

Similarly, and focusing on the educational field, the Maria Montessori Special Education Centre has been developing an educational intervention project since the 2008/2009 academic year, promoted by the Department of Therapeutic Pedagogy, observing in the students a bond with the assistance dogs and an increase in motivation that results in an improvement in the learning process.

Therefore, and based on scientific evidence, it is demonstrated that, in addition to the fact that caring for animals has notable advantages for the development of human beings, it helps to improve the quality of life in all its dimensions (cognitive, motor, social, physical, etc.).

Fortunately, and after much effort, the Organic Law on Education includes curricular work on animal rights, which will result in a better society, as well as the acquisition of values that promote respect for living beings and the environment.

In accordance with the aforementioned Law, the aim is to

- know and value the animals closest to human beings and adopt ways of behaving that favour empathy and care for them from every educational institution;
- critically assess social habits related to health, consumption, care, empathy and respect for living beings, especially animals, and the environment, contributing to their conservation and improvement.

However, an in-depth analysis of the teachers' perspective on the use of the dog in the educational system as a pedagogical resource is unquestionable, given that this is a key factor in influencing the acceptance of this idea and compliance with the various interventions proposed in the school, as reflected in studies such as those by Steel, Williams and McGeown (2021).

From this perspective, a simulation is considered with the general objective of raising awareness among educators who teach Didactics and Educational Innovation and who are responsible for teaching future Pre-school, Primary or Secondary Education teachers about the need to include these objectives in teaching programmes based on an educational model by competences.

General goals:

a. To raise awareness among educators who teach Didactics and Educational Innovation and who are responsible for teaching future Pre-school, Primary or Secondary Education teachers of the need to include these objectives in teaching programmes from an educational model based on learning by competences according to the Sustainable Development Goals of the 2030 Agenda.
b. To decide on a protocol about the inclusion of the dog as a pedagogic figure.

There is an urgent meeting to deal with these issues and a steering committee has been appointed by the Rector of the University.

Steering committee:

- Department Director (x2).
- Expert in educational legislation.
- Teachers of Didactics and Educational Innovation.
- School teacher.
- Vice-Dean (x2).
- Vice-Rector for Academic Organisation.

Profiles

Profile 1. Department Director

As Director of each department and considering the continuous training and lifelong learning of the teaching staff, you have decided to bring together the teaching team with the aim of learning about educational legislation and the consideration of the dog as a pedagogical resource given the existing successful experiences that guarantee improvements in the teaching–learning process in educational centres. In addition, teachers should be reminded of the need to rethink teaching programmes based on the competency-based learning endorsed by the Sustainable Development Goals agreed upon in the 2030 Agenda.

Profile 2. Expert in Educational Legislation

As an expert, you are invited to this meeting to specify the new developments included in the current educational legislation, which clearly states the need to work

on animal rights. This implies a curricular rethinking based on competency-based learning and compliance with current regulations. You are very committed to your work and are willing to suffice any of the educators' needs in terms of regulations, legislation and educational policies.

Profile 3. Teachers of Didactics and Educational Innovation (x2)

As expert teachers in didactic programmes applied to future professionals, all curricular elements should be included and, therefore, you should be aware of the potential of the use of the dog in the classroom in order to consider its inclusion in curricular contents. Personally, you like the proposal and are willing to vote in favour only if the majority feels satisfied with it. You have studied the benefits of dogs in the classroom and are totally in favour of their use as a pedagogical resource. However, you would not like to argue with your workmates.

Profile 4. Teachers of Didactics and Educational Innovation (x2)

As expert teachers in didactic programmes applied to future professionals, all curricular elements should be included and, therefore, you should be aware of the potential of the use of the dog in the classroom in order to consider its inclusion in curricular contents. You do not feel very confident with changes as they imply the need for teacher training. You tend to double think things much and question measures imposed on your work quite often.

Profile 5. School teacher

You have experienced the use of dogs as a pedagogical resource. Your task is to make other teachers aware of all the benefits of this action and to present successful experiences.

Profile 6. Vice-Dean 1

You have a broad experience in this position and are used to taking up challenges. Now you have the responsibility of approving or not the use of the dog in educational environments. It is important for you to analyse all the different agent intervening in the decision and estimate the specific financial endowment associated with it.

Profile 7. Vice-Dean 2

You accepted this position a couple of years back and find some issues still difficult to tackle. This time a new challenge has put you in the spotlight. You have the responsibility of approving or not the use of the dog in educational environments. You feel unsure of what is best. You should analyse all the different agent intervening in the decision and estimate the specific financial endowment associated with it.

Profile 8. Vice-Rector for Academic Organisation

You are responsible for all the academic training at the University and must comply with the requirements established by the National Accreditation Agency. Due to a negative evaluation of the Bachelor's Degrees in Early Childhood and Primary Education received recently at your university, you feel unsure whether this is the right moment to discuss the inclusion of the dog in education.

2. **Debriefing**

a. Give a brief description of the interventions of each of the members of your team, highlighting the evolution of the discussion.
b. How would you apply simulation as a methodological resource in your training activities?
c. How have you controlled that your personal interests (subjectivity) do not interfere with the simulation?
d. Describe your degree of motivation during the simulation.
e. What other aspects do you think could have been included in the simulation?
f. How has your perception changed regarding the use of dogs as a pedagogical resource in the classroom?
g. General comments.

References

Benedito Monleón, M. C., Caballero Martínez, V., & López Andreu, J. A. (2017). Terapia asistida con perros en niños y adolescentes. *Rev Esp Pediatr, 73*(2), 79–84.

Brelsford, V. L., Meints, K., Gee, N. R., & Pfeffer, K. (2017). Animal-assisted interventions in the classroom—A systematic review. *International Journal of Environmental Research and Public Health, 14*(7), 669.

López-Cepero Borrego, J., Perea-Mediavilla, M. D. L. Á., Tejada Roldán, A., & Sarasola Sánchez-Serrano, J. L. (2015). Validación del cuestionario de actitudes ante las intervenciones asistidas por perros (CAINTAP) en estudiantes universitarios del sur de España: Beneficios y temores percibidos. Alternativas. *Cuadernos de Trabajo Social, 22*, 123–138.

Maisón-Baibiene, M., Silva, L., Tomassi, A., & Borrino, L. (2020). La educación emocional asistida por perros, como puente de bienestar en el aula. *Calidad de Vida y Salud, 13(Especial)*, 144–165.

Martos-Montes, R., Ordóñez-Pérez, D., Martos-Luque, R., & García-Viedma, M. (2015). Intervención asistida con animales (IAA): Análisis de la situación en España. *Escritos de Psicología (Internet), 8*(3), 1–10.

Reilly, K. M., Adesope, O. O., & Erdman, P. (2020). The effects of dogs on learning: A meta-analysis. *Anthrozoös, 33*(3), 339–360.

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Sample 6: Code Update

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Raluca Pop

Overview

This is a sample of a simulation scenario that can be discussed and analysed by pre-service teachers with the purpose of developing their language skills, critical thinking, and problem-solving skills, as well as increasing their collaborative skills. Emphasis is placed on developing their pedagogical knowledge in areas that relate to bullying, conducting exams and engaging actively in a continuous professional development. The sample describes in detail the profiles of the participants and the goals that need to be accomplished in the time allotted for this simulation activity.

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: Pre-service teachers. Level of English: B2-C1.
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach: To learn and reflect about

- a new ethical code to be established by a school;
- the outcomes (language competence, intercultural communicative competence and professional development) of integrating simulation in their teaching; they analyse the benefits of integrating simulation-based activities in pre-service

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teacher training; they analyse the structure of a simulation-based activity; discussions on the topic of classroom management in the EFL classroom.

Sociolinguistic approach:

- expressing arguments, reading for specific skills, reading for global understanding, coherence and fluency in spoken communication, cohesion and signposting in written form, listening for specific information, listening for gist, inferring meaning out of context and ability to collaborate.

5. **Briefing**

Code Update

The mission of Zalda School is to help students realize their full potential and develop as independent individuals who can adapt to the ever-changing society. The relationship between the administrative board and the teachers on the one hand and the students and their parents on the other hand needs to be strengthened. In response to some ethical conflicts and ambiguities that took place the previous year, Zalda School intends to update the code of ethics that describes the values and rules to be followed by all the members of the school community. The Head of Zalda School hopes that an updated version of the code of ethics should offer clear guidance and more specific rules and sanctions within the following areas: bullying, conducting exams, teachers' professional development, raising school taxes and increasing Zalda School's visibility.

A formal meeting takes place between the Head of the School, an economist who is in the school's administrative board, a parent who is a member of the parents' association, a student who is a member of the students' association, a teacher who represents all the teachers employed by the school and a representative of a private company that offers online educational tools.

The Head of Zalda School raises awareness on the twenty-two reported cases of bullying that have taken place the previous school year. He urges the administrative board, teachers and parents to consider some rules of ethical conduct and to come up with a plan to diminish the number of cases of bullying.

General Goal: to update the code of ethics that describes the values and rules to be followed by all the members of the school community.

Profiles: The Head of the School, an economist who is in the school's administrative board, a parent who is a member of the parents' association, a student who is a member of the students' association, a teacher who represents all the teachers employed by the school and a representative of a private company that offers online educational tools.

A formal meeting takes place.

Profiles

Profile 1: The Head of the School

The Head of Zalda School hopes that an updated version of the code of ethics should offer clear guidance and more specific rules and sanctions within the following areas: bullying, conducting exams, teachers' professional development, raising school taxes and increasing Zalda School's visibility.

Goal:

The Head of Zalda School raises awareness on the twenty-two reported cases of bullying that have taken place the previous school year. He/She urges the administrative board, the teachers' representative and the parents' representative to consider some rules of ethical conduct and to come up with a plan to diminish the number of cases of bullying. In addition, the school faces a lawsuit brought against by the private company that offered online educational tools. Therefore, the Head of the School wants to see what kind of measures can be taken by the administrative board and the teachers' representative.

Profile 2: The Economist

The economist is a member of the school's administrative board and is responsible for all the funding received by the school and all the expenses that have to be paid. In order to reduce operating expenses, the economist tries to find ways to raise money for the school.

Goal:

The economist presents the school's financial situation pointing out that due to lack of funding the school can no longer offer students free access to some online educational tools that are needed in the teaching of many school subjects. The economist suggests that each student should pay 10 Euros per month to have access to these useful educational tools. To improve the school's financial situation, the economist recommends increasing Zalda School's visibility with the help of social media by posting online pictures of students and their teachers taking part in different projects. The economist rejects a pay increase in the wage of teachers in the midst of financial problems.

Profile 3: The member of the parents' association

The member of the parents' association aims to establish better communication between the school and the parents. He/she has gathered some complaints from parents linked to students' fatigue, the quality of the teaching process and the bullying phenomenon.

Goal:

The member of the parents' association strongly disapproves of this fee of 10 Euros stating that because many students have a low socioeconomic status background, they will not be able to comply with this rule. The parent wants to know the

repercussions that emerge from this lack of payment. In addition, because social media can represent a real threat to students by increasing their level of anxiety, invasion of privacy, identity theft and cyberbullying, the parent enquires about the measures that the school will take to address these issues. Parents are concerned about the bullying phenomenon and want measures to be taken.

Profile 4: The students' representative

The students' representative has been elected by students to represent them in various policy and academic matters linked to the school.

Goal:

The students' representative has been informed of the following situation: students take part in too many school projects which affects their academic performance and tires them. Teachers are required to state their opinions on this matter.

Profile 5: The teachers' representative

The teachers' representative has been elected by teachers to represent them in various policy and academic matters linked to the school. He/she considers that all teachers employed by the school perform their job with efficiency and responsibility and that they try to address students' learning needs. The representative is concerned about the workload that teachers need to accomplish for their continuous professional development and about the diverse ways in which they should increase Zalda School's visibility. Because teachers are unhappy about their current wage rate, the teachers' representative tries to negotiate a pay rise.

Goal:

The teachers' representative considers that these school projects represent a meaningful outcome both for teachers and students. In addition, they raise the school's visibility. As an argument, they suggest that these projects are required by the administrative board as part of each teacher's continuous professional development. As exams are concerned, teachers would like students to be expelled for cheating at exams. There have been several cases of cheating and the administrative board did not react because the ethical code of the school did not mention this aspect. In addition, they require to have both written and oral exams that would offer a thorough description of students' competence levels. Still, such a measure implies more working hours and thus a rise in the wage is required.

Profile 6: The representative of the private company

The private company collaborated with the school the previous year and offers both teachers and students access to various online learning tools. An agreement has been signed according to which, in exchange for free access to the learning tools, teachers from the English Department would create some online modules for the company. Even if the agreement was signed by the school, teachers did not deliver the products.

Goal:

The representative of the private company states that teachers from the Zalda School did not create the requested online teaching modules as stated in the written agreement. Therefore, they have been faced with major financial losses. The representative urges the school to solve this problem and demands teachers to finish their work and provide a detailed schedule for the project.

Debriefing

Once the simulation is over and all the teams have reached their decisions, the facilitator asks questions related to the whole simulation experience, the learning outcomes achieved and students' satisfaction with their team or with their own participation and involvement. The facilitator should share his/her notes to point out some language errors, mistakes in concepts used or any other aspect that requires correction and reinforcement. Together with the facilitator, participants discuss the conclusions, accept or argue the weak points assigned to their updated version of the code of conduct and provide feedback on the organization of the activity and its outcomes. To enhance pre-service teachers' pedagogical knowledge, another direction for the discussions taking place in the debriefing stage can include the design of a SWOT analysis focused on the benefits, strengths, opportunities and threats of integrating simulation-based activities in pre-service teacher training programmes.

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Sample 7: Inside the Gesell Chamber

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Silvia Sempere Faus

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: 3rd or 4th year students of the Degree in Law and the Degree in Criminology, as well as postgraduate students who are graduates of the Degree in Criminology, Degree in Law, and Degree in Psychology. It is assumed that students have acquired the previous competences of the subjects Introduction to Psychology, Psychology of Testimony, Criminal Procedural Law, and Criminal Law.
3. **Time allotted**: Action: 4 sessions of 2 h each.
4. **Learning outcomes**.

It is important to note that learning outcomes other than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach:

- demonstrate how the participant performs his/her role in the scenario;
- demonstrate knowledge of the principles of contradiction, orality of the procedure, and immediacy;
- develop sufficient skills and competences for the actual practice of giving a statement by an infant.

Sociolinguistic approach:

- develop social and language abilities to debate, negotiate, and make decisions in higher education;

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- control simple and some advanced grammatical forms;
- improve the student's oral and written linguistic skills, specifically in the correct use of legal-procedural terminology and the psychology of testimony;
- acquire the necessary skills for the drafting of a final report;
- produce extended stretches of appropriate language fluently.

Explanatory note

The simulation attempts to shed light on how pre-constituted evidence is carried out in the investigation phase of criminal proceedings, consisting of taking the testimony of an infant victim of a sexual offence, in the context of the so-called Gesell Chamber. Pre-constituted evidence is carried out in the investigation phase of a criminal procedure and is subsequently reproduced in the oral trial. The recording of the statement by means of the Gesell Chamber is a means of evidence that is recognised in different countries, the purpose of which is to avoid the double victimisation of the infant, known as secondary victimisation. In other words, in addition to the harm suffered by the child as a direct consequence of the offence, there is the psychological damage caused by the criminal proceedings, especially having to repeat the statement of the facts on several occasions (police, forensic doctor, prosecutor, and judge, among others).

With the recording of the testimony of the infant victim in the pre-trial phase for later reproduction in the oral trial phase, it is therefore possible to avoid this secondary victimisation and the damage to the emotional development of the infant, avoiding the infant appearing in court to testify again months or years after the criminal acts have taken place when he or she is already in the process of psychological recovery.

The Gesell Chamber is a room in which the infant is interviewed by experts, normally a psychologist, in a friendly environment in which he/she feels comfortable, which is used in judicial proceedings for sexual crimes committed against infants, in those Courts that have these means available.

The Gesell Chamber uses technological means to take the statements of infants through the intervention of an expert, normally a psychologist, who conducts the interview and interacts with the infant. It generally consists of two rooms, divided by a wall on which a mirror is placed that only allows visibility from one of the parties, i.e., from the room where the judge, lawyers, public prosecutor, etc. are present, but not from the room where the infant is with the expert, preventing the infant from seeing the legal operators who are observing him/her from the room where the interview is taking place. The child shall be accompanied by the professional who is with him/her in order to create a private and friendly atmosphere. It is also advisable for the relevant technical staff to ensure that the recording of the statement does not present any technical image or sound problems (see Fig. 27.1).

Fig. 27.1 Image of the Gesell Chamber at Universidad Católica de Valencia https://codimg.com/team-training/blog/en/gesell-chamber (photo made by the author)

5. **Briefing sheet**

Inside Gesell Chamber

The Judgment of the Criminal Division of the Supreme Court dated 28 November 2019 ratifies the conviction of a man for the crime of sexual abuse of an infant as defined in article 183.1.3 and 4 d) C.P., in relation to article 74 C.P. and raises the relevance of the statement of the infant.

The Alicante Court of Instruction no. 2 instructed summary proceedings against *Robert* under number 3 of 2016, and, once concluded, referred it to the Alicante Provincial Court, Second Section, which on 11 October 2018 handed down a judgment containing the following proven facts:

> The defendant Robert, born on NUM000 1968, of Brazilian nationality, with a criminal record with no penal repercussions, moved from Brazil, where he is from, to Spain in 2005, in the company of Emma, his partner, and Cristina, mother of the former. Their first address in the *country was in this Region, first in the BARRIO000 in this city, then they settled in STREET000, number NUM001, in the town of ADDRESS000, and 6 or 8 months later, they moved to a house in ADDRESS 001, ADDRESS N002, ADDRESS 003, and returned years later to ADDRESS 000, where they lived in the house at number NUM003 of STREET 001. Shortly after beginning his stay in Spain, the defendant travelled to Brazil to take charge of Monica, born on NUM002of 2001, and at the time 4 years old. The child was taken to the home of*

ADDRESS 001, in ADDRESS 002, and became part of a family nucleus made up of her mother, Cristina, her sister, Emma, then linked to the defendant by stable ties as a partner or sentimental companion, and as a result of this relationship, the child Alejandra, a year younger than Monica, also lived under the same roof. The ADDRESS 002 house consisted of 3 rooms, one of which was used as a bedroom for the defendant and Emma, the other, where Monica and her niece Alejandra slept, and a third, adjoining but separated by 25 m from the main building, where Cristina, mother of his adult daughter Emma, and his youngest daughter Monica, slept. In this family environment, the defendant exercised the powers and levers of family leadership, without renouncing to beat his partner, his mother and his younger sister Monica, when he saw his will being thwarted. His former work as a driver in international transport was followed by long periods of leisure and time spent in the house, except for occasional passenger transport services to the airport and a stay of several months in Brazil. The house they occupied in ADDRESS 002 was located in the countryside, far from the town of ADDRESS 004, and had a swimming pool. It all began in 2010 one August afternoon, when Monica was only 9 and a half years old.

After having been playing and swimming in the pool with the defendant's children, she went to rest in her room. Her mother was accidentally not at home and her sister and the defendant's partner went to work every evening at a discotheque and did not return until well into the early hours of the morning. It was then that Robert, taking advantage of the absence of adult residents in the house, entered the girl's room, who smelt a certain whisky odour when he approached her, and when she woke up, he ordered her to stay still and not to make any noise, and took out one of her breasts and sucked on it. From that day on, the defendant's furtive intrusions continued with an almost daily frequency, sometimes in the afternoon and much more frequently at night, always taking advantage of his partner's working hours and the location of the mother's bedroom outside the house. It did not take Robert long to introduce his fingers into the vagina of the minor in his habitual incursions, practices that he alternated on occasions with the manipulation of her breasts, to bring them closer to his penis until he squeezed it, rubbing and rubbing it with them.

One afternoon when Monica was sitting on a sofa watching television, while her mother and sister were out of the house, the accused sat next to her and demanded that she masturbate him. Monica was already 11 years old when the full sexual intercourse began. With this in mind, Robert would enter her room at night and move her to the room he had intended for the conjugal bedroom, penetrating her vaginally. To calm the minor's restlessness and nervousness and to prevent her mobility, agitation and displeasure from hindering intercourse. Robert began to supply her with tobacco, then alcohol and finally marijuana. Later, he added two "dildos" belonging to Emma, his partner, to these practices, and on one occasion he plunged one of them,

equipped with a vibrator, into Monica's anal cavity, who had to spend more than an hour extracting it under the shower, checking how sperm, blood and faeces flowed from her vaginal and anal cavities.
One afternoon, when the presence of the minor's relatives was an obstacle to having carnal access to her, Robert took her to an abandoned house, inside which he placed his jacket on the floor so that she could lieon it and thus cohabit with her. The last carnal intercourse took place when in 2013 the family moved to live in ADDRESS 000, in STREET 001, when Robert was about to leave, having decided to break off his relationship with Emma; one day in May, he entered Monica's room, placed her on her knees and with her back to him, leaning on his hands, he penetrated her anally for the last time. These events led to alterations and disorders in the minor's behaviour, which resulted in DIRECTION006, domestic abductions to obtain these substances, expulsions and running away from home with interruption of her schooling, until she ended up in a shelter where she even received mobile phone messages from the defendant requesting sexual favours or silence, leaving her with DIRECTION005 as a sequel. On 3 November 2014, Cristina, the minor's mother, appeared at the police station and reported the facts. The judgment highlights, among other issues, in its second ground of law that: "The testimony of witnesses who are minors or disabled and in need of special protection shall be carried out, when necessary to prevent or reduce the harm that may arise for them from the development of the process or the practice of the diligence, avoiding the visual confrontation of the witnesses with the accused. To this end, any technical means may be used that makes it possible to carryout this evidence, including the possibility of the witnesses being heard without being present in the courtroom through the use of communication technologies. These measures will also be applicable to the statements of the victims when their initial or subsequent evaluation leads to the need for these protection measures. In the development of this reform, the victim may be placed in a room where the statement is received immediately but with technological means that prevent visual contact. And so, the Court states that "Without any protest or objection, Monica, accompanied by a psychologist, gave her statement from a friendly courtroom, as the experts had requested, after the presidency had cleared the courtroom, the Public Prosecutor's Office having requested this break in the full publicity of the trial, without any opposition". The Court refers to and develops in detail the content of the minor's statements with regard to the acts that have led to the development of the result of the proven facts. And in the presentation made by the minor, she recounts in detail the facts that make up the account of the proven facts. This leads the Court to state that "There is therefore not the slightest reason to doubt the veracity of the account given by the victim". In corroboration of the minor's statement, the Court asserts that: "The veracity of the victim's statement, given her minority, is also supported by a peripheral and corroborating element, of particular significance, such as the

expert reports on psychological assessment, whose drafters at the trial ratified their content in full, and which address an analysis of the credibility of the minor's testimony".
On this point, when it comes to the statements or testimonies of minors, whose personality is still immature, with mental resources still being formed, which can influence their way of narrating what they have witnessed, the psychological expert evidence, by verifying the degree of verisimilitude of the minor, in accordance with professional methods of recognised prestige in their circle of knowledge, is revealed as a source of evidence of indisputable value for assessing the testimony of minors, victims of a crime of a sexual nature. It cannot therefore be ignored that, according to the report drawn up by those in charge of the ADDRESS 007 project, Monica's account "meets sufficient criteria of credibility and validity" (FD nº 7)
The court considers Monica's account to be truthful, sincere, plausible and persistent. It is corroborated by objective expert evidence that supports its objectivity.
The psychologists ratified the report before the court and explained the protocol of reception of the victim by the Regional Ministry, the elaboration of the precise data by the corresponding technician and the referral to those responsible for the "ADDRESS 007 Project". They referred to the interviews with Monica, their video recording and full transcription, the analysis to which they were subjected and the judgment of credibility and validity that they issued.

In view of the facts declared proven and the legal grounds related to the friendly room or Gesell Chamber, the Examining Magistrate of the proceedings will order the practice of the statement of the minor through the Gesell Chamber, summoning all the parties who are to participate in this test, that is, the Judge himself, the legal counsel for the administration of justice, the Public Prosecutor, the victim's legal counsel, the accused's legal counsel, the court psychologist, and the infant.

Testimony of the minor

The minor will not be a role-player, but a written testimony will be made for everyone to read, because what is important is that each participant learns how to perform in similar situations.

I remember well how one summer his two children were in the swimming pool. It was August and I was 9 and a half years old. My niece and I went to sleep. Then Robert came in, he smelled of whisky, took out one of my tits and sucked it. He told me to be quiet and not to make any noise, and that was the end of it.

After a while he put his fingers in my vagina, put his penis between my tits and rubbed it. He did all this in my room, in my sister's room, in the car or in an abandoned house or villa. My sister worked in a discotheque until 5am. This happened almost every day, not always at night, sometimes in the afternoon. At night he would wake me up and take me to my sister's room. Since I was a child, Robert had a very strong control over me. He told us not to cry. He would beat me and my sister with a belt on his knees.

One afternoon my mother was not there and neither was my sister. My niece was sitting and asked me: -why are you crying and I answered her: because your father is hurting me, a lot. I didn't explain any more. Another one, she was sitting on the sofa watching TV, and she demanded me to give her a hand job. At the age of 11, when I was already having sex, I was very nervous. He gave me tobacco, then alcohol, then marijuana. He would give me money to buy marijuana, or he would give it to me to relax me during full sex, starting one day when he came into my room, put his fingers in my vagina, and then pulled down my panties and put his penis in my vagina. That was the first time. My sister had two "dildos". He put them inside me vagina. The small one, with a vibrator, he put it up my ass and it stayed inside (sobs).

I had to spend an hour to get it out. Semen and blood came out. When I took it out, faucal secretions came out too. That moment marked me. I stopped showering, dressing up, looking at myself in the mirror or going to class. The next day again, and always with penetration.

A couple of months before filing the complaint, he went to Brazil.

When I was kicked out of the house I was 13 years old. When Robert left, my mother wouldn't give me money to buy drugs and I stole I told a friend about it because my mother didn't care about me and she also knew that Robert beat my sister.

...

I still love him for everything he did for me, but I also hate him for what he did to me. He was the only person who cared about me.

When we were with people he treated me like a daughter; at night he treated me very badly. Whenever there was penetration he smelled of whisky or beer. I thought I was living a bad dream.

I remember well how one summer his two children were in the swimming pool. It was August and I was 9 and a half years old. My niece and I went to sleep. Then Robert came in, he smelled of whisky, took out one of my tits and sucked it. He told me to be quiet and not to make any noise, and that was the end of it.

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Since I was a child, Robert had a very strong control over me. He told us not to cry. He would beat me and my sister with a belt on his knees.
One afternoon my mother was not there and neither was my sister. My niece was sitting and asked me: -why are you crying and I answered her: because your father is hurting me, a lot. I didn't explain any more. Another one, she was sitting on the sofa watching TV, and she demanded me to give her a hand job. At the age of 11, when I was already having sex, I was very nervous. He gave me tobacco, then alcohol, then marijuana. He would give me money to buy marijuana, or he would give it to me to relax me during full sex, starting one day when he came into my room, put his fingers in my vagina, and then pulled down my panties and put his penis in my vagina. That was the first time. My sister had two `dildos". He put them inside me vagina. The small one, with a vibrator, he put it up my ass and it stayed inside (sobs).
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...
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When we were with people he treated me like a daughter; at night he treated me very badly. Whenever there was penetration he smelled of whisky or beer. I thought I was living a bad dream.
When my mother was ready to ask for help, Robert told me that if they took me to a psychologist I shouldn't say anything, that I could go to jail.
The last time was in ADDRESS 000, in my room; he put me on all fours and there was penetration. That was the day he left home.
I remember a day when there was touching in the swimming pool. Robert a started caressing my thighs, a friend of his arrived and asked me if he was touching me. I told him no.
Another day he took me to an abandoned villa. He took off his jacket and put it on the floor for me to lie down. He penetrated me. There was nothing around. We went to that house because my sister and my mother were in our house.
When my mother was ready to ask for help, Robert told me that if they took me to a psychologist I shouldn't say anything, that I could go to jail.
The last time was in ADDRESS 000, in my room; he put me on all fours and there was penetration. That was the day he left home.

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Another day he took me to an abandoned villa. He took off his jacket and put it on the floor for me to lie down. He penetrated me. There was nothing around. We went to that house because my sister and my mother were in our house.

The minor therefore describes, not a specific event, but a continuous account of actions of sexual assault on the minor.

General goal:

The aim of the discussion is not to resolve a legal-criminal question, but a procedural one, i.e., to find out how this type of pre-constituted evidence works and its evidential value in criminal proceedings, and how it is developed in practice.

Profiles

Judge, Legal Officer in the Administration of Justice, Prosecutor, Counsel for the private prosecution, the Defence Counsel, and the court psychologist.

Profile 1. Judge

You are the judge in charge of the investigation of the proceedings for the crime of sexual abuse of an infant. You have to order the taking of the pre-constituted evidence of an infant of about 12 years of age who has been the victim of several offences of sexual abuse since she was 9 years old, and for this purpose, you summon all the parties to a day and time in the Gesell Chamber of the Court.

Functions and responsibilities:

- To direct the development of the evidence and give the floor to the Prosecutor and the lawyers of the victim (private prosecution) and the aggressor investigated in the proceedings.
- To ensure that the test is carried out without incident and that all those present ask questions about the facts under investigation.
- To pass on the questions asked to the psychologist so that she can ask them to the infant.
- To declare, where appropriate, the impertinence of the questions asked by any of the parties.

  To provide legal arguments for the refusal of a question.

– To ask the psychologist any questions he/she deems appropriate to clarify any aspects of the facts that have not been made clear after the questions of the rest of the parties.
– To organise the order of intervention of the parties:
  - The Prosecutor.
  - Prosecution counsel.
  - The victim's counsel.

Profile 2. Legal Officer in the Administration of Justice

You are the legal advisor to the investigating magistrate's court in charge of these proceedings. Your role during the hearing of the minor is to ensure that the hearing takes place without incident and to attest to what happens.

You must document in writing in a record drawn up by you all the questions that are asked and the comments of the parties involved in the taking of the evidence.

Profile 3. Prosecutor

You are the prosecutor investigating the proceedings in which an uncle is accused of the sexual abuse of his underage niece (9 years old when the abuse began). According to the regulations, your duties are the following:

– To accuse the person under investigation, the aggressor who committed the sexual abuse.
– To ask all the questions that are necessary to clarify the facts for which the person under investigation (the abusing uncle) will be judged.
– To oppose the questions asked by the prosecutor/victim's lawyer.
– To protest if the judge rejects a question as inappropriate.

Profile 4. Counsel for the private prosecution

You are the lawyer for the private prosecution, i.e., the minor victim. According to the regulations, your functions are the following:

– To accuse the accused, the aggressor who has committed the sexual abuse, and for this purpose, your questions must be aimed at incriminating the accused and for the victim to tell in as much detail as possible what happened.
– To ask all the questions that are necessary to clarify the facts for which the defendant (the abuser uncle) is to be tried.
– To object to the questions asked by the defence counsel.
– To protest if the judge rejects any question for considering it inappropriate.

Profile 5. Defence Counsel

You are the defence counsel, i.e., the uncle who sexually abuses his niece. According to the regulations, your duties are the following:

- Defend the person under investigation, the aggressor who has committed the sexual abuse.
- To ask all the questions that are necessary to clarify the facts for which the defendant (the abusing uncle) will be tried.
- To oppose the questions asked by the prosecutor/victim's counsel.
- To discredit the testimony of the minor by casting doubt on her credibility.
- To protest if the judge rejects a question as inappropriate.

Profile 6. Psychologist

You are the forensic psychologist who will be in charge of conducting the interview with the child without the child knowing that the other parties are present behind a mirror, because only you will be there for the child.

She will receive the questions from the judge who will pass on to her the questions asked by the other parties and will translate them from legal language into a language that the child can understand.

6. **Debriefing**

The participants have to reflect on whether the Gesell Chamber is the appropriate medium for taking statements in the pre-trial phase of criminal proceedings and whether the pre-constituted evidence prevents secondary victimisation of the child. The question of its validity and whether it is also suitable for children from 14 to 17 years of age will be examined.

A questionnaire for the evaluation is to be prescribed.

Facilitation notes:

The aim is to carry out a simulation of how pre-constituted evidence is developed in the pre-trial phase of criminal proceedings for subsequent reproduction in the trial, consisting of taking the testimony of a minor victim of a sexual offence, in the context of the so-called Gesell Chamber.

The recording of the statement by means of the Gesell Chamber is a means of evidence whose purpose is to avoid the secondary victimisation suffered by the victims in their contact with the criminal process.

It is a room in which the minor is interviewed by experts, normally a psychologist, in a friendly atmosphere, divided by a mirrored wall that makes it impossible for the minor to see the room in which the legal operators are present.

The students will assume the different roles involved in the reality of the practice of this test in court, such as the judge, the lawyer for the administration of justice, the prosecutor, the victim's lawyer, the defendant's lawyer, or the court psychologist. Theoretical-practical classes beforehand. Two-hour sessions on the

theoretical, legal-procedural, and psychological explanation of the testimony of the infant victim in criminal proceedings.

And a one-hour class on brainstorming of ideas by the students and visualisation of a recording of a Gesell camera.

The following ACTIVITIES will be carried out PRIOR to the simulation:

1. Master classes on what the Gesell Chamber is, the concept of secondary victimisation and the special vulnerability of the infant victim, focusing on the regulation of pre-constituted evidence in criminal proceedings.
2. Review of previous documentation: Students will read the sentence of the Criminal Chamber of the Supreme Court or the Provincial Court (in the case of Spain) or the competent Court (in other countries), in which the practice of this evidence has been carried out in the testimony in a Gesell Chamber, with the aim of putting the student in the situation. The teacher will prepare a questionnaire on the content of the sentence related to the pre-constituted evidence in order to pre-assess the understanding of the scenario derived from this sentence.
3. Preliminary discussions with a video showing the victimisation of the child when he/she has to testify repeatedly about the criminal acts he/she has suffered. (In Spain, this video is very illustrative: https://www.youtube.com/watch?v=NtZaK-Jo8Qs). Subjects to be involved in the preparation of the simulation activity.

The teacher will plan the activity, starting with the theoretical sessions. For this purpose, if the subject teacher is a specialist in procedural law, he/she can be assisted by specialists in criminal law and by professionals who in their daily work have contact with the statements of child victims (such as judges, lawyers, and/or prosecutors). It is important to have the theoretical contribution of an expert in the psychology of testimony, who is usually in charge of intervening in the Gesell Chambers of the different Courts of Justice.

At the beginning of the activity and having already assigned the different roles to the students, as in any simulation, the facilitator can assume a particular role. In this case, the teacher facilitator will assume the role of the director of the development of the Gesell Chamber test. In this way, the teacher will be able to resolve doubts and supervise the work of the different teams formed with the assigned roles.

Subsequently, the facilitator will become a mere observer, with one student per chosen team taking on the role of test director with the role of judge, as it is the judge who, in practical reality, is responsible for directing this type of test.

The students will simulate taking a statement from an infant victim of a sexual abuse offence, or the offence of the teacher's choice in accordance with the sentence being studied (normally these will be sexual offences). Each student will assume a role in the development of this test.

At the end of the simulation exercise, the teacher will summarise his/her conclusions on the development of the exercise, debrief with the students, and include an overall evaluation of the activity (e.g., questionnaire, open questions, etc.).

Preparation of the simulation activity by the teacher.

The teacher will choose a factual scenario, based on a conviction by the Criminal Division of the Supreme Court or the Provincial Court on sexual abuse of an infant (or a crime of a sexual nature) in which the Gesell Camera was used in the pre-trial phase as pre-constituted evidence.

It should be borne in mind that the judgment does not specify how this test is carried out (this knowledge will have been acquired in the previous theoretical classes).

In the case that the teacher gives to each student, the date and number of the judgment, the facts recognised by the judgment, and the legal grounds relating to the pre-constituted evidence, as well as the judgment, will be specified. It is not necessary for them to have access to the full sentence at the time of the simulation (as they have already read it in the previous theoretical sessions) as the purpose of the simulation is not to delve into criminal matters but exclusively procedural ones, specifically in the development of the pre-constituted evidence.

Each team will be given the case, as well as the profiles with each of the roles assigned to each student, as specified below. The simulation will take place in a scenario that reproduces the Gesell Chamber as shown in the photographs above. At the Faculty of Psychology of the UCV, we have a Gesell Chamber. However, in those Universities that do not have this space, any other space will be available, even if there is no central mirror simulating the structure of this type of room.

The students will be recorded, with their signed consent, and the recording will be distributed to a representative of each team, with a questionnaire, so that the students themselves can self-evaluate after viewing the recording.

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Sample 8: Mission Hospital

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Joaquín José Alfonso Beltrán

1. **Team members**: 5–6 participants. Multiple teams can participate at the same time.
2. **Type of participants**: Undergraduate medical students and students of History of Medical Science.
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general course goals.

Thematic approach:

- to reflect on diversity within hospital training centres as an opportunity to rethink practices and concepts that have become entrenched as an apparently immovable reality;
- to reflect on the mission of hospitals as centres for the training of ``servants" of society, within the framework of internationalisation;
- to reflect on how new procedures in scientific medicine affect good practices in hospitals, and how these influence users and practitioners as areas of potential internal conflict.

Sociolinguistic approach:

- to develop social and language abilities to debate, negotiate and make decisions in higher education;
- to control simple and some advanced grammatical forms;

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- to improve pronunciation at the segmental and suprasegmental levels;
- to manage a wide range of vocabulary when speaking on a specific topic;
- to produce extended stretches of appropriate language fluently.

**Additional note*

Doctors' orality and dealing with patients is a competence that must be cared of. Both teachers and students recognise the importance of this type of competence, but their learning has been left mainly to example and personal experience.

The students should be able to organise and carry out an activity that simulates a session of a congress in its entirety. There will be 6 groups divided into committees (organiser, scientific, logistics, press, groups per session, and assistants). 2/3 sessions of 40/60 min. are planned. The general objectives proposed are focused on hospitals as training centres (diversity, mission, and good practices). Other different ones could be addressed. The aim is to develop social and linguistic skills (improvement of grammar, pronunciation, vocabulary, and language fluency). An information sheet will be handed out beforehand with the proposal, where the competences of each group and member are assigned. At the same time, the recommended lectures and bibliography are assigned. The activity will be proposed at the beginning of the term, and a specific date will be set at the end of the term to implement the simulation scenario. At least 2 intra-group and 2 inter-group meetings will be held. A team observation model is proposed. For the last session of the activity, more than one facilitator will be required to take notes on the proposed template. Specific questions are proposed to the learner to facilitate debriefing.

5. **Briefing sheet**

Mission Hospital

As a group of students, you are required to organise a conference within the next 2 months. The topic will delve into the importance of hospitals as training centres. What ideas for improvement would the conference bring about? Hospitals are training centres today for doctors, undergraduates, and postgraduates. Several issues are to be dealt with, such as the current model of training in practice, as opposed to the ideal training model; virtual medical education; among others. What would hospitals of the future be like as training centres? Which would be an ideal training hospital model for your university? It is highly recommended that students read and analyse the following documents:

"Educational models in medicine and their historical evolution" (Research in medical education. Rev Esp Méd Quir 2015; 20:256–265). CanMEDS should be discussed (CanMEDS is a medical education framework that emphasises the core competencies of a physician). The document describes the knowledge, skills, and abilities that medical specialists need to achieve better outcomes when they come into contact with patients and identifies seven roles: physician expert, communicator, collaborator, leader, health advocate, scholar, and practitioner. CanMEDS

used to be a major achievement in Canada: all 17 medical schools use it, in addition to its worldwide recognition (Medical Competency Framework, 2015). "The Hospital of the Future. A new role for leading hospitals in Europe". Ribera J., Antoja G. Centre for Research on Innovation in the Healthcare Sector, IESE, University of Navarra.

General objective:

To organise and carry out an activity that simulates the performance of a conference session in its entirety.

Steering Committee:

a. Organising Committee (6 students).
b. Scientific Committee (6 students).
c. Logistics Committee (6 students).
d. Press Committee (6 students).
e. Session chairs (4 sessions of 6 students each).
f. Conference attendees (12 students).

Internal composition of each group/committee:

a. Organising Committee: President, Executive President, Vice-President, Secretary, Vocal 1, Vocal 2.
b. Scientific Committee: President, Executive President, Vice-President, Secretary, Member 1, Member 2.
c. Logistics Committee: Chairperson, Executive Chairperson, Vice-Chairperson, Secretary, Member 1, Member 2.
d. Press Committee: Chairman, Chief Executive Officer, Vice-Chairman, Secretary, Member 1, Member 2.
e. Bureaux (four bureaux): Chairman, Members 1 to 4, rapporteur.
f. Congress participants: 12 duly accredited students.

Profiles

Profile 1. Organising Committee

As the organising committee, some of the responsibilities are listed as follows:

- As decision-makers of the event, the committee must steer and ensure that the conference gets off the ground and goes ahead to the fullest extent.
- Conduct a brief opening and closing of the conference.
- Give internal coherence to the conference.
- Coordinate all the committees.

Profile 2. Scientific Committee

Some of the responsibilities are listed as follows:

- Organise the academic contributions.
- Adjust their duration in terms of content (to encourage subsequent debate and dialogue with the forum), and in uniform formats. The contents are free, but the committee must ensure that they meet minimum quality requirements.
- Communicate with the constituents of the roundtables.

Profile 3. Press Committee

Some of the responsibilities are listed as follows:

- Provide adequate pre-conference publicity, if necessary, by generating a logo.
- Generate a conference programme.
- Report afterwards on what has taken place, and if necessary, write a report with images if deemed appropriate.

Profile 4. Logistics Committee

Some of the responsibilities are listed as follows:

- Provide attendees with specific accreditation and receive attendees appropriately.
- Ensure that the material resources are available for the proper running of the session.
- Ensure that the tables have what is necessary for their intervention and avoid unnecessary loss of time.

Profile 5. Congress attendees

Some of the responsibilities are listed as follows:

- Ensure that you have the appropriate accreditation.
- Make an adequate summary of the contributions, as these are required by the corresponding department at your university in order to justify attendance at the conference.
- Within this group, at least 2 questions must be asked in the speaking time granted by the corresponding Chair (minimum of 8 questions, 2 per table).

Make interventions according to the dynamics learnt in class in order to take turns to ask questions correctly, and establish a constructive dialogue of listening and reflection.

6. **Debriefing**

A team observation model will be used. The observer will move among the teams to take notes and observations. Given the magnitude of the proposed scenario, the activity will be carried out throughout the first four-month period, during which the contents are taught. A specific date will be set at the end of the course for the implementation of the simulation scenario. The students will have to hold at least 2 intra-group meetings and at least 2 inter-group meetings in the classroom.

The following observation sheet is proposed to facilitate the facilitator's notes. For the last session of the activity, more than one facilitator will be required for proper note-taking and use of the proposed template.

Simulation

Team	Organizing committee
Profile members	Chair Exec. Chair
	Vice Chair Secretary Vocal 1. Vocal 2.
Date	
Facilitator	

Protocol

Comments on profiles	Chair Exec. Chair
	Vice Chair Secretary Vocal 1. Vocal 2.
Performance	Chair Exec. Chair Vice Chair
Phases	Meeting 1 Meeting 2 Meeting 3 Meeting 4 Meeting 5

6. **Debriefing**

1. Evaluate your participation in the group in which you have participated. Comment on your contributions.
2. Comment on what you learned during the activity, and whether you felt that you performed your assigned role appropriately.
3. Did you feel confident during the preparation process and the simulation of the conference?
4. How did you feel in your profile; why do you think you felt this way?
5. Do you think that the role you were assigned was appropriate to your personal characteristics? Would you have liked to play a different role?
6. What happened in your group? How did the debate in your working group work out? And with the other groups? Did it work? Did you coordinate and help each other?
7. Did you feel that you were able to be heard and defend your opinions freely according to your role? Did you have to defend opinions according to your role that were contrary to your own particular way of understanding the situation?
8. Have you changed your point of view regarding the situation given to you?
9. Comment on the development of the activity and the final outcomes.
10. Describe the strengths and weaknesses encountered in the implementation of the scenario. What agreements or decisions of the different groups would have provided a solution to the weaknesses encountered?

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Sample 9: Joint Campus

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M. Laura Angelini

1. **Team members**: 5 + participants. Multiple teams can participate at the same time.
2. **Type of participants**: Higher education academics and administrative board members.
3. **Time allotted**: Action: 40–60 min in 2–3 sessions.
4. **Learning outcomes**.

It is important to note that other learning outcomes than the ones presented below may be addressed in accordance with the general goals.

Thematic approach:

- analyse your institutional reality according to higher education demands;
- analyse the international arena to find branch universities to collaborate;
- analyse academic offers and department goals to match the project requirements;
- analyse educational policies at a faculty level;
- assess the needs and priorities of each institution;
- elaborate educational adaptations.

Sociolinguistic approach:

- emphasise academic purposes and the values of cooperation, mutual benefit and collaboration;
- develop social and language abilities to debate, negotiate and make decisions in higher education;
- manage a wide range of vocabulary when speaking on a specific topic.

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5. **Briefing sheet**

Internationalisation of higher education is described as "the process of integrating an international, intercultural and global dimension into the aims, teaching/learning, research and service functions of a university or higher education system". Internationalisation emphasises the relationship between nations, people, cultures, institutions and systems, whereas globalisation emphasises the concept of worldwide flow of economy, ideas, culture, etc.

By 2025, demand for international education is expected to reach 7.2 million students and some, but certainly not all, will start student mobility. As a result, the number of new providers offering programmes to students in their home countries is growing at an unprecedented rate. Mobility on an international scale is no longer just a matter for students, teachers and researchers, but academic programmes are being offered across national borders and joint campuses are being set up in many countries around the world.

While these initiatives aim to increase access to higher education and satisfy interest in obtaining degrees and jobs abroad, serious problems arise in relation to the quality of academic provision and the recognition of degrees. There is a high demand for high-quality programmes and legitimate degrees through new types of collaborative arrangements and agreements.

Following the concept of European universities, made up of member states, university institutions and student organisations, developed out of French President Emmanuel Macron's speech at the Sorbonne University in Paris, last year's first call involved 54 partnerships with more than 300 universities from 28 EU member states. Seventeen successful partnerships received a total of 85 million euros.

Your university is carrying out an educational programme renewal plan to strengthen strategic partnerships between higher education institutions worldwide. The aim is to promote university networking that boosts educational quality, research and internationalisation. In this sense, your institution should elaborate educational adaptations using the most innovative tools and material resources in order to create a process that allows students to really lift their learning by taking into account their optimal ways of dealing with each area of study.

More flexible study and research possibilities with fewer bureaucratic obstacles can facilitate the career paths of students, doctoral candidates, researchers and staff. As an institution that has always taken a step further to shape the educational arena, your university encourages all faculties to participate in the JOINT CAMPUS call led by the European Commission.

Your faculty is leading the pilot project and must form alliances with other faculties from foreign universities in order to participate in the project. The winning alliances will receive €120 million and will serve as a model to enhance quality research and professional connections.

The finalist alliances of the JOINT CAMPUS project will have a three-year funding period to lay the foundations for a solid architecture that enables the mobility of students, researchers and university staff. Their plan includes a recognition database and a mapping of study possibilities so that students can select the

modules from the Alliance with the assurance that they will receive automatic academic recognition. In addition, the implementation of innovative teaching and learning formats will allow all students to benefit from JOINT CAMPUS' international proposals. For example, students will be able to take online courses offered by partner universities, work virtually with other students on projects or participate in workshops and seasonal events.

Call for proposals: until the end of the present year.

For this project, your institution has to make adaptations and strategic changes that guarantee a solid training of academics and students in order to be eligible for the project.

In order to participate in the Alliances, a revision of the curricula of core subjects is imminent, with special attention to methodological proposals framed in critical pedagogies and active learning approaches.

Objectives:

- to analyse your institutional reality according to higher education demands;
- to analyse the international arena to find branch universities to possibly collaborate with;
- to analyse academic offers and department goals to match the project requirements;
- to analyse educational policies at a faculty level;
- to assess the needs and priorities of your institution;
- to elaborate educational adaptations;
- to emphasise academic purposes and the values of cooperation, mutual benefit and collaboration;
- to critically approach the study of curricula in general, and of core subjects in particular in order to

  – re-design those necessary to meet the requirements;
  – justify changes and suggestions in light of the approaches and methodologies chosen;
  – select faculties/universities as potential partners. Justification required.

Project Steering Group

- Project Director.
- Academic Coordinator.
- Faculty (x3).

Profiles

Profile 1. Project Director

You have a full-time job at your university. You are looking forward to directing this project that will boost your academic career. You will have a reduction of 12

credits (1 credit = 25 h) to direct and supervise the project. You are a senior professor in the institution together with other academics, some of whom may be reluctant to take on new responsibilities. Your functions can be summarised as

- know the reality of the teaching staff, the infrastructure and resources and the curricula;
- agree on deadlines for application and securing partnerships with other universities/faculties;
- act as a binding link between institutions and as a motivating agent to build accountability, commitment and confidence in the success of the project;
- handle pressure to make immediate and medium-term improvements;
- show determination to establish correct procedures, without overburdening classroom teachers, while demanding accountability and demonstrating transparency throughout the process;
- justify the measures taken in any case;
- select universities as potential partners.

Profile 2. Academic Coordinator

You have been selected by the Rector of your university to assume this position. You have experience in university management in your faculty and more than 10 years in the present institution.

You feel you relate fairly well with most of your colleagues. For this responsibility, you have 6 credits (1 credit = 25 h) of teaching reduction. Your responsibilities include

- bringing together teaching staff in order to identify qualified candidates to take on possible subjects linked to the project;
- coordinate and evaluate the modification of subjects following the framework; coordinate selection of prospective partner institutions.

SUBJECT	LEARNING OUTCOMES	APPROACHES & METHODOLOGIES	RESOURCES	TASKS	GROUPS	ASSESSMENT

Profile 3. Faculty staff (x4)

After many years at the institution, you are grateful to be involved in the Steering Group at your university. You have an affable relationship with your Dean who has expressly encouraged you to participate.

You are enthusiastic about methodological innovation and spend time planning your classes. The subjects you teach are of interest to the project. You must negotiate agreements and propose methodological changes that guarantee learning and optimise classroom time.

Among your responsibilities, you must justify the modifications that concern your subject (effectiveness/potential/appropriateness of the chosen methodology) in order to participate in the project.

SUBJECT	LEARNING OUTCOMES	APPROACHES & METHODOLOGIES	RESOURCES	TASKS	GROUPS	ASSESSMENT

You should make suggestions for potential partners to form an Alliance.

6. **Debriefing**

Debriefing A-Organisational results?

Debriefing B-Questionnaire

1. What did you think of the JOINT CAMPUS scenario proposal? Was it appropriate to your experience and expertise?
2. How did your team's interventions turn out?
3. Did you change your views during the discussion?
4. From the simulation, do you think you are able to solve similar challenges?
5. How do you rate your level of confidence during the simulation?
6. Did you prioritise your sector's objectives?
7. Did you feel motivated during the simulation?
8. What have you learned about higher educational demands? Do you feel you can achieve the objectives posed in the simulation in your institution? Why/why not?
9. General comments.

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Conclusions

In producing this book, we set out to find which fields of study are benefitting, and would benefit, from the use of simulation. We have been able to gather sufficient evidence of the adaptive and flexible nature of simulation used in different fields, from technical to more humanistic ones: engineering, medicine, biology, ecology, social sciences and economics.

Simulation as critical pedagogy understands education as transformation and change. It seeks horizontal relationships, participation and inclusion of all voices. It advocates dialogic practice and extends to all educational fields. From higher education to school, this is the ideal environment for social and cultural transformation, as opposed to a place for the rote reproduction of content.

Thus, we have attempted to make explicit how learning is identified in the vast literature on simulation and how simulation benefits learning in many areas. For example, the different authors' contributions have highlighted, among other virtues: specific content retention, research and content assimilation, critical understanding, higher order thinking skills development, language practice, social and intercultural abilities, command of digital skills, and metacognitive development. However, the need remains to remedy the deficit in empirical evidence and case studies using simulation in academic contexts. What simulation actually fosters has been widely described in specific literature, but there are still outstanding questions, such as the following: does it work for all kinds of participants? If not, what type of participant may do better with simulation? Are there any flaws in the simulation that deserve more attention? How can simulation be assessed? In turn, how should participant performance be evaluated in a simulation? To what extent does the success in a simulation rely on the facilitator or on the participants, or on each of the simulation phases? What are the predictive factors for difficulty in simulation methodology in teacher education? Should profile building entail dissonance to better navigate the issues analysed?

Because of the flexibility of simulation, we wanted to explore to what extent the integration of simulation and virtual exchange has an impact on the learning of future teachers and facilitators. This book confirms that there is recent evidence on the successful implementation of simulation and reports interesting benefits from

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educational experiences, including a positive impact on relationships across borders, dialogic learning, teacher-students acting as real practitioners, specific literature openly discussed and questioned and mutual understanding of the educational issues represented in the simulation scenario. It is worth mentioning that understanding and awareness are not automatic consequences of the nature of the simulation. Solid preparation is needed to unfold all its potential. The added value of this integration of virtual exchange and simulation is the development of intercultural thinking, giving the participants the opportunity to broaden their horizons without the need to travel. However, we believe that this is just the beginning of a promising methodological adaptation, more inclusive, pluralistic, sustainable and affordable.

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