

# Chapter 12

## Conclusion

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It is now ten years since we witnessed the peak of popularity in the educational use of virtual worlds in higher education and the subsequent decline in interest as educators came to the realisation that much of the hype was based on over-inflated expectations. Yet far from languishing in the “trough of disillusionment”, as the authors of this collection show, virtual worlds have now come of age as educators continue to explore the pedagogical affordances of these technologies for engaging students in authentic activities designed to improve their technical and employability skills.

In Chap. 1, “Pedagogy and Learning for Sustainability in a Virtual World Scaffold”, Thorne and Macgregor demonstrated how a blended learning approach using the virtual world, a real classroom, and online learning facilitated through a learning management system created an authentic learning environment for learner engagement with sustainability curricula. Drawing on their analysis of students’ written, oral and ePortfolio submissions, and evidence gathered through a survey, observations and conversation, the authors concluded that the virtual world assisted students in developing critical thinking and problem-solving skills for real-world sustainability learning. Their findings confirm a high level of learner engagement with the topic, improved student engagement with the subject’s learning outcomes, and the development of graduate attributes including information literacy, self-reliance and interpersonal understanding, and proficiency in the use of tools and technologies.

The second chapter, “Intercultural Competence and Virtual Worlds” by Corder and U-Mackey, demonstrated the use of the virtual world to facilitate the

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development of students' intercultural competence through authentic learning activities. Corder and U-Mackey's findings drawn from analysis of case studies of student engagement with the virtual world and plotting students' intercultural development using Bennett's (1993) DMIS reported that each student experienced respective shifts in their intercultural competence and developed deeper understanding of their own identities and underlying values and beliefs that influenced their behaviour. However, their findings also suggest that the students varied in the extent to which they applied their understanding to develop strategies and adapt their behaviour, in the virtual world and in real life. They found the virtual world to be unpredictable and fluid in relation to behavioural boundaries, but at the same time a rich and authentic learning environment. Their findings also provide a word of caution that the rich environment does not automatically ensure that students will become competent with their development of intercultural practices. They concluded that there are symbiotic synergies between the affordances of virtual worlds for intercultural competence development and the need to already be interculturally competent for effective engagement and learning to take place. Their findings suggest that students need to be prepared and supported to deal with the technological challenges of the virtual world as well as the emotional and behavioural challenges of virtual cross-cultural interaction.

Jones, Farley and Murphy in Chap. 3 on "Virtual Worlds as Restorative Environments" found that the virtual world could realise the vision of the Australian Government's focus on education to improve health, well-being and economic competitiveness. They explored pre-service teachers and their perceptions of their own personal well-being, sense of belonging, social connectedness, personal creativity and engagement through their experiences in a formal garden setting in the virtual world. The authors analysed students' responses to an online survey comprising eight affective and behavioural measures of attentional fatigue, which provided baseline measures of fatigue for each student. Following 30-min engagement with the virtual restorative environment, students completed a perceived restorativeness scale incorporated into the online survey and were also asked to repeat the attentional fatigue items and open questions about their experiences in the virtual world. Their findings suggest that, providing students are familiar with the virtual environment, it can serve as a restorative environment. However, lack of familiarity with the virtual world led to a negative impact on some students' sense of immersion and the restorativeness of the environment.

Chapter 4, a "Self-guided Exploration of Virtual Learning Spaces", written by Reiners, Wood, Teräs, Teräs, Gregory, Chang, Steurer, McDonald and Fardinpour, explored virtual worlds as a space to create authentic, immersive and high-fidelity experiences for their learners, through the creation of controlled replicas of real life. The experiences they created for their learners enabled the learners to self-pace their learning through a prototype of the nDiVE framework combining authentic learning, gamification, emerging technologies and design principles that are currently being used in the gaming industry to create the spaces for their learners.

The following Chap. 5, written by three of the same authors, Fardinpour, Reiners and Wood, "Action-based Learning Assessment in Virtual Training Environments",

continued to explore authentic learning in a virtual world through an Action-based Learning Assessment Method using automated formative assessment. The authors compared recorded actions of a learner in a virtual world with recorded actions by experts. Action-sequences of learners were generated to provide formative feedback to improve learner performance. Their preliminary analysis of experiments showed the validity as well as enhanced opportunity to describe and evaluate training sessions in virtual training environments.

In Chap. 6, “Engagement in Second Life: Language Anxiety and Motivation”, the authors, Grant, Huang and Pasfield-Neofitou, described their use of a virtual world to provide an authentic virtual study abroad program for language learners. The authors found that their students experienced less foreign language anxiety once they had undertaken the virtual world experiences as opposed to their counterparts, who only experienced their learning in a face-to-face classroom. They found that the students’ perceptions of the authenticity of their learning environment contributed to the reduction of foreign language anxiety and motivation.

Further, Chap. 7, “Cognitive Engagement in Virtual Worlds Language Learning” along the same theme with two of the same authors, Henderson, Henderson, Grant and Huang, investigated learner engagement in terms of students’ cognition whilst experiencing their learning in the virtual world. The authors used a simulated recall methodology to discover student’s cognition—affect, strategy planning, evaluating, metacognising and justifying. They explored the relationship between learner cognition, instructional design and other triggers, whilst their students undertook their learning in the virtual world. Their findings revealed a high frequency of cognitive processes stimulated by programmed lessons involving the use of curriculum knowledge and skills to successfully complete in-world tasks. However, some of the thinking processes, despite being related to the task or curriculum, were found to be focussed on meeting the task requirement, suggesting the need to ensure adequate clarity in instructions and supports are provided by the teacher.

The following Chap. 8, “Anticipating Engagement: Pre-Service Teachers Perceptions of Virtual Worlds” by Jacka and Hill, explored student engagement whilst using a virtual world for teaching and learning at the higher education level and also in the classroom of school students from kindergarten to year 12. The authors explored blog posts in relation to student’s perceptions of virtual worlds for learning, and their findings suggest a correlation between engagement and the creative aspects that virtual worlds provide. They found that the design of the learning environment within the virtual world was important when integrating the technologies that are available.

Butler, in Chap. 9, “Utilising Second Life Machinima-Facilitated Narratives to Support Cognitive and Imaginative Engagement across an Undergraduate Curriculum”, described a case study utilising a virtual world to produce machinima videos in the Law School. The machinima was used to enhance engagement and promote authentic learning, using a blended learning approach without requiring students to enter and participate in the virtual world itself. Narratives were facilitated by machinima and linked by a common storyline and recurring characters

running throughout the program. Butler explored the pedagogical approach for using machinima and discussed the findings from student responses to end of course survey incorporating a series of Likert scale and open-ended questions. He found that the overwhelming majority of students reported strong agreement to the benefits of the machinima in helping them to understand the application of negotiation principles in real-world practice, providing a realistic setting to understand the principles of negotiation, enabled students to gain an understanding of negotiation theory and practice and was an enjoyable experience as part of their studies. He further found that the qualitative feedback highlighted the authenticity of the approach as one of the most consistent themes emerging from student feedback.

In the final Chap. 10, “Decision Making Supported by Virtual World Systems vis-à-vis Enterprise Systems’ Uncertainty and Equivocality”, the authors, Rudra, Jæger and Ludvigsen, investigated the potential of the authentic setting of the virtual world for facilitating students’ business decision-making using a combination of explicit and tacit. Their findings suggest that virtual worlds have unique properties that support tacit knowledge in a global distributed business environment.

## **Concluding Remarks**

These ten chapters provide some of the leading virtual worlds’ research from Australia and New Zealand. They have focussed on the affordances of virtual worlds for facilitating authentic learning, improving learner engagement and developing an understanding of cultural diversity, with a particular focus on the affordances of the virtual world platform for supporting students in the development of technical and generic skills required for professional practice. The chapters reflect a diversity in the ways in which the virtual world was incorporated into the curriculum across a wide range of disciplinary fields, but what is consistent across all the chapters are the strategies employed by educators to maximise the pedagogical affordances of the technology to engage their students in authentic activities.

The findings of evaluation of the efficacy of the approaches employed in the curriculum across the disciplines represented in this book demonstrate the ways in which the virtual world provided a real-world context for students and authentic assessment tasks. The findings also highlight the potential of the virtual world for embedding opportunities for students to experience expert performance, whilst also demonstrating the potential of the virtual worlds for delivering automated feedback, coaching and scaffolding for students.

However, the findings from the studies reported in these chapters remind us that there are also unintended consequences and challenges in utilising any innovative technology in the curriculum. These challenges include technical difficulties and the learning curve associated with navigating and interacting with the virtual world.

Several of the authors have highlighted the importance of mitigating these challenges to maximise the benefits of student engagement in virtual world activities.

Finally, the findings and lessons learned from the experiences of the educators and researchers, whose experiences are documented in this collection of chapters, remind us that technology can never be an educational panacea, and that sound pedagogical practices and research informed evidence are requisites for ensuring that the potential benefits of learning in a virtual world are realised.

The use of virtual worlds in higher education has finally reached “the plateau of productivity”, and the authors of this collection demonstrate the strategies educators are employing to provide productive and effective authentic learning opportunities for their students. However, as new technologies emerge, some of which may be integrated or complement virtual world learning, the need for ongoing exploration of the affordances of these technologies to facilitate authentic learning experiences and research to determine the efficacy of the strategies employed by educators to maximise learning outcomes will continue.

## Reference

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