Insung Jung   *Editor*

Open and Distance Education Theory Revisited

Implications for the Digital Era

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Open and Distance Education

Series Editors

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Developing human capital through education and training is crucial to social and economic progress. However despite efforts to achieve equity and learning opportunities for all, resource constraints and lack of knowledge and skills can overwhelm the capability of government and non-government agencies, institutions and teachers to provide the required levels of education and training by conventional means. More and more providers are recognising that open, distance and online means of delivery have an important role to play both in providing formal schooling and tertiary education and informal and nonformal education and training for the countless millions wishing to upgrade their skills, knowledge and competences at anytime, anywhere at their own pace, and thus making the lifelong learning for all agenda a reality. This book series examines ways in which open and distance education can empower and enable individuals, groups and even entire communities to develop the knowledge and skills necessary for life and work in the 21st century, help to reduce poverty and inequality, achieve independent and sustainable development and meet the demands of the 21st century knowledge economies and open societies.

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Contents

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Chapter 1
Introduction to Theories of Open and Distance Education

Insung Jung

Open and Distance Education in a Historical Context

Open and distance education (ODE) has evolved through several historical stages, from correspondence education to the use of print, radio, and TV, to the use of teleconferencing, computers and multimedia, and so on up until online learning including Massive Open Online Courses (MOOCs). As the general definition of ODE has shown—"nontraditional forms of teaching and learning in which the students and tutors have little or no face-to-face contact, a separation in space and often also in time" (Sewart, 2014, p. 1), it is complex in nature and scope as it involves a wide range of nontraditional ways of teaching and learning that are mediated by various media and technologies. Thus, this chapter highlights only key events, technologies, and people in the course of ODE development to offer a brief historical background for the book.

Correspondence education, the early form of ODE, appeared in the early 1800s in Europe. In Lund, Sweden in 1833, a correspondence course ran as an ad in *Lunds Weckoblad*, a weekly publication that offered to teach "Composition through the medium of the Post" (Holmberg, 1995, p. 47). In England, a more organized correspondence program using the nation's uniform postal system was introduced in 1840 by Isaac Pitman to teach shorthand writing. In the USA, the Chautauqua Literary and Scientific Circle was created in 1878 to offer a four-year correspondence reading

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course for adults. And in 1892, the University of Chicago began offering college-level correspondence courses and became the first traditional university in the USA to offer correspondence education (Kentnor, 2015). In 1938, the International Council for Correspondence Education was founded in Canada as the first worldwide association of correspondence educators, researchers, and institutions; in 1982, it changed its name to the International Council for Open and Distance Education (ICDE)[1] to reflect the developments in ODE such as the integration of new technologies and openness concept.

In the early 1990s, *radio and TV* were innovative and viable means to reach more learners in the history of ODE. In the USA, since the University of Wisconsin–Extension began to operate the first nationally licensed radio station for its program, 176 educational institutions obtained licenses for educational broadcasting (Kentnor, 2015, p. 24). In Europe and Latin America, radio was more widely used than in the USA as an inexpensive broadcasting tool targeting a large number of audience. The TV came into the public sphere in 1927 and was introduced in education in 1934 by the University of Iowa (for details, see Moore & Kearsley, 2012). Educational TV broadcasting between the 1950s and early 1970s (before the establishment of open universities in Europe and Asia in particular) was mainly used by educators in the classroom as a supplementary visual medium and for children and families at home for educational programs, not for ODE. Holmberg (1995, 2006) argues that until around 1970, no radical changes in ODE were observed even though there were more sophisticated use of media and methods in various ODE settings.

The late 1960s through 1980s saw the global spread of the idea of ODE mostly in higher education as a form of *Open University*, resulting from accumulated experiences in correspondence education, the use of radio and TV in education, and an increased social demand for higher education in many countries. The founding of UK Open University in 1969 stimulated critical change in ODE around the world. In Europe, the National University of Distance Education in Spain was established in 1972, FernUniversität in Hagen, Germany in 1974, Anadolu University, Turkey in 1982, Open University in the Netherlands in 1984, and Universidade Aberta in Portugal in 1988. In Asia, Korea National Open University was established in 1972, Allama Iqbal Open University, Pakistan in 1974, Sukhothai Thammathirat Open University, Thailand in 1978, The Open University of China in 1979, Universitas Terbuka, Indonesia in 1984, Indira Gandhi National Open University, India in 1985, Payame Noor University, Iran in 1987, and Open University of Hong Kong in 1989. In Africa, the University of South Africa was established in 1948 as the world's oldest distance teaching university. Most African open universities came later compared with those in other regions: Open University of Tanzania in 1992, Zimbabwe Open University in 1999, National Open University of Nigeria in 2002, Open University of Sudan in 2002, Open University of West Africa in Ghana in 2011, and Open University of Mauritius in 2012. At the secondary level, the Korean Air & Correspondence High School was established in 1979, India's National Open School in 1989, and more schools opened after that.

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[1]For more details on the history of ICDE, visit https://www.icde.org/history.

A majority of these institutions is public and supported by their government. While these ODE institutions are keen to introduce newer technologies including interactive video conferencing, the internet, and mobile devices, most of them still make extensive use of such traditional media as print, correspondence, radio and TV, and audio and video cassettes, often in combination with face-to-face sessions. These are often the cheapest and most feasible options especially for institutions located in the developing regions.

In the 1990s, the rapid emergence and widespread use of the internet revolutionized ODE even though early computer-assisted instruction and online courses were introduced in the 1980s. As networked technologies became more available and affordable, many single-mode open universities and ODE programs in conventional institutions established new forms of online provision, offered various forms of online services, and new providers created ***virtual (or online) universities and schools***. Early adopters of online education include the University of Phoenix (1989), Virtual High School, Inc. (1996), and Western Governors University (1997) in the USA, Universiti Tun Abdul Razak (UNITAR) in Malaysia (1997), the Virtual University of Pakistan (2002), and over 20 virtual universities in South Korea were established since 2001.

MOOCs were first introduced in 2008 and began making headlines in the international press from 2011 to 2012. They have certainly raised the profile and public interest in ODE as a revolutionary mode to reduce costs and expand access to higher education. Today, we observe the exponential growth of MOOCs and their users around the globe even though many would claim that their initial purpose to revolutionize and democratize education are overblown and somewhat inconsistent with how they are actually being practiced (Jung, 2016; Littlejohn & Hood, 2018).

As ODE developed, various theories and models have emerged or been borrowed to understand and explain their different aspects and practices.

Theories of Open and Distance Education

Hoover and Donovan (1995, p. 40) suggest that in the social sciences,

(1) The theory provides *patterns* for the interpretation of data.
(2) Theory *links* one study with another.
(3) Theories supply frameworks within which concepts and variables acquire *special significance*.
(4) The theory allows the interpretation of *larger meanings* of findings for other theorists, researchers, and practitioners.

As stated, theory in ODE helps us organize, summarize and explain knowledge, develop meaningful research questions, and carry out empirical studies needed in the field. It also helps us prescribe optimal strategies and make future predictions of ODE.

Foundational Theories

Even though a weak knowledge base in theoretical foundations of ODE has been indicated as a problem in previous literature (e.g., Garrison, 2000), the following foundational theories have greatly contributed to the understanding and development of the field.

- *The theory of autonomy and independence* was developed between the 1960s and 1970s and further elaborated in the 1980s along with the theory of *adult learning* (e.g., Knowles, 1984). Wedemeyer (1977) explains ODE with a particular focus on the learner's self-independence while studying at a distance. To promote learner autonomy and motivation in ODE, Holmberg focuses on *guided conversation* between the student and the teacher via learning materials.
- *The theory of industrialized teaching and learning* developed by Peters (1983) focuses on the socioeconomic context of ODE and views the field as an industrialized form of teaching and learning. The theory highlights the division of labor in materials development and delivery and the use of efficient and standardized production procedures in ODE.
- *The theory of transactional distance* proposed by Moore (1973) links concepts of learner autonomy, dialogue, and structure in ODE based on J. Dewey's notion of the transactions between teacher and student. It focuses on the dynamic interaction of these three concepts in the particular communications and psychological space resulting from the separation of teacher and student.
- *Openness* has been a central theme of education in general (Iiyoshi & Kumar, 2008) and "a possibility inherent in distance education." (Harris, 1987, p.14). Distance education and openness are frequently used together as shown in ODE. The concept of openness has been reformulated and redefined with the development of distance education policies and technologies, especially with the development of open universities since the late 1960s, including open choice in teaching and learning strategies and more recently, open content and resources. The theory of openness represents the history of distance education and requires critical understanding.

While these foundational theories have been included in several ODE handbooks and other publications and applied in research, the majority of the recent adopters of online learning and MOOCs appear to be unaware of them and their ramifications (Baggaley, 2016).

Today's ODE makes use of various digital media and instructional delivery models and serves many more diverse students in a wider range of settings and contexts. In order to advance theory, research and practice, there is a pressing need to revisit the time-honored theories developed in the era of correspondence education and traditional distance education, review accumulated research evidence regarding the appropriateness of these theories, and refine and update the theoretical frameworks to reflect the changing environments.

Emerging Theories

As network technology-based ODE becomes more common in the field, new theories have been developed in response to the new and different contexts. Such emerging theories include connectivism, the community of inquiry model, the model of extended e-teaching and e-learning spaces, and heutagogic theory.

- *Connectivism* has been proposed as a theoretical framework to help ODE researchers and practitioners develop a better understanding of the dynamics and opportunities of the socio-technical context for technology-enabled learning (e.g., Downes, 2005; Siemens, 2005). It focuses on new learning opportunities created by Internet technologies based on the assumption that learning happens across networks of people with different sociocultural backgrounds. It is particularly applicable to MOOCs and dialogue-rich networked learning.
- *The community of inquiry model* focuses on a two-way interaction between teacher and student in an open and online learning environment and examines the creation of meaningful and deep learning through three key elements—social presence, cognitive presence, and teaching presence (e.g., Garrison, Anderson, & Archer, 2000). In such a context, the sociocultural construction of knowledge is emphasized.
- *An extended spatial model of e-education* focuses on the extended nature of teaching and learning spaces in open and online learning (e.g., Jung & Latchem, 2011). Criticizing the insufficient embrace of the nexus between various philosophies and educational methods in previous theories and models in ODE, this model tries to incorporate diverse philosophies and methods in education into a more comprehensive framework for planning and action in e-teaching and e-learning.
- *A pedagogy–andragogy–heutagogy continuum* focuses on changes in learning approaches, including teacher-led, self-directed, and self-determined learning approaches in today's open and online learning environments (Blaschke, 2012). Reexamining the teaching and learning practices embodied in heutagogic theory will help ODE developers assist learners who are more accustomed to conventional methods to take the initiative and manage their own learning in technology-supported personalized learning environments.

Borrowed Theories

Theories from other disciplines are also helpful in determining new and emerging systems, modes, and practices of ODE in non-formal learning in developing countries in support of the Global Education for All and Sustainable Development Goals including workplace training and professional development outside the framework of formal education. These include cognitive theory, instructional design theory, media theory, leadership theory, motivation theory, and situated learning theory.

In particular, the following theories have greatly contributed to the research and development of ODE.

- *The instructional design (ID) theory* is used to inform and guide ODE program design, development, and evaluation (e.g., Branch & Dousay, 2015). The complex nature of ODE makes it necessary to adopt systemic and systematic approaches to instructional design, course development and implementation, assessments and revisions. With the changes in the teaching and learning environments, it is time to revisit and update the ID theory for recent open, online, and mobile learning environments.
- *The media theory* applies to the complex social–political–philosophical principles, which organize ideas about the relationship between the media and the users. Understanding theoretical knowledge bases related to pedagogical and andragogical features of media, media selection, and media effects is essential for the development of ODE as an academic and quality field of practice.
- *The motivation theory* has helped ODE researchers and practitioners understand how to motivate and empower distance learners, maintain their interest, improve their performance, and complete their studies in both formal and non-formal contexts. Revisiting this theory and its application in current ODE practice will inform further research and development in the digital age.

Features of the Book

The book is based upon an extensive review of the literature and interviews with ODE scholars who have developed or researched its theories. It comprises an introductory chapter, 11 chapters discussing 11 sets of theories or models, and a concluding chapter.

This chapter explores the complex nature and scope of ODE in a historical context and creates a timeline from correspondence education up to MOOCs. It then examines the role of theories and models as a knowledge base for ODE research and development and briefly introduces the 11 selected theories for the book.

Part 1 revisits four foundational theories that have been updated and refined as a result of further research and practice in ODE.

- Chapter 2 examines the four crucial pillars of ODE—independent study, transactional distance, guided conversation, and adult learning and discusses the implications of these for today's ODE.
- Chapter 3 reviews Otto Peters' industrialized teaching and learning theory and discusses how this theory helps us understand recent open and online education.
- Chapter 4 examines Michael Moore's transactional distance theory in detail and analyses evidence for its application in recent ODE.
- Chapter 5 reviews conceptual changes of openness in ODE and discusses the expansion and refinement of openness within the open education and OER movement and MOOCs.

Part 2 explores four new theories emerging from recent developments in ODE.

- Chapter 6 begins with traditional learning theories and their limitations for understanding and developing networked learning experiences and introduces connectivism and recent studies applying connectivism in MOOCs.
- Chapter 7 reviews the community of inquiry framework and its three key concepts—cognitive, teaching, and social presences, and examines empirical research as a knowledge base for further development of ODE.
- Chapter 8 revisits models for e-education from extended spatial and time perspectives and discusses recent studies that provide evidence for extended spaces and time for e-teaching and e-learning.
- Chapter 9 reviews pedagogical, andragogical, and heutagogic approaches to technology-supported personalized learning environments and discusses recent research supporting heutagogic learning.

Part 3 examines three theories drawn from other disciplines that can improve our understanding and practice in today's ODE.

- Chapter 10 revisits assumptions, theories, and models of instructional design that have been applied in various educational situations including ODE and discusses key ID themes for recent online learning environments.
- Chapter 11 reviews important theoretical perspectives on media in ODE and suggests practical guidelines for future development in the field based on previous media studies.
- Chapter 12 introduces motivation theories and examines empirical research of applying these theories to motivate learners, maintain their interest, and improve their performance in various ODE contexts.

The concluding Chap. 13 discusses how the theories presented in the book can be used for future ODE researchers and practitioners.

Each of the theory chapters attempts to:

- Discuss and analyses particular sets of theories, theoretical frameworks, and models,
- Review the evidence that applies to, confirms, supports or conflicts with the theories in various ODE contexts,
- Describe how the theories and models apply to or fail to apply to research and practice in contemporary ODE, and
- Offer theoretical and practical suggestions that will guide ODE researchers and practitioners in the digital age.

In this way, we hope the book will provide a unique and up-to-date knowledge base for ODE scholars and graduate students, which will enable them to make sense of ODE theory, research, and practice and comprehend the gaps in theoretical models in an era of open, online, and mobile learning. It will also equip ODE practitioners with practical advice and theory-based guidelines for making and justifying decisions and actions in ODE development, implementation, research, and evaluation.

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Chapter 2
Independent Study, Transactional Distance, Guided Conversation and Adult Learning

Colin Latchem

Keywords Adult learning · Guided conversation · Independent study · Open and distance education · Transactional distance

Introduction

In Ancient Greek, the antonym of *didactism* (διδακτικός: to teach or instruct) was *maieutics* (μαιευτικός, meaning midwifery), the Socratic method wherein students were encouraged to develop the skills and dispositions to think and study for themselves. In his *On Listening to Lectures*, Plutarch observed that 'The correct analogy for the mind is not a vessel that needs filling, but wood that needs igniting—no more—and then it motivates one towards originality and instills the desire for truth.' Over the centuries, there have been many notable autodidacts who were partially or wholly self-taught including Erasmus, Descartes, Leonardo da Vinci, Michael Faraday, Charles Darwin and Steve Jobs.

Independent Study

Independent study in modern higher education was first championed by Charles A. Wedemeyer at the University of Wisconsin–Madison, known as 'the father of

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We are deeply saddened to announce that Colin Latchem passed away on July 3rd, 2018, right after he submitted this chapter for our book. He will be greatly missed by all of us.

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American distance education'. He used the term 'independent study' in preference to what was then called 'correspondence education' or 'extension studies'. He argued that the societal imperative of lifetime access to learning required higher education provision to be characterized by openness, an absence of learning prerequisites, granting learners' choice in regard to the place, timing, methods and content of their learning, a recognition that different learners have different cognitive styles, effective use of communications technologies, testing, diagnosis and assistance for learners and collaboration between institutions to enrich the learning society (Wedemeyer, 1981).

Wedemeyer's 1981 Theory of Independent Study closely resembles the currently accepted characteristics of open and distance education:

- The student and teacher are separated.
- The normal processes of teaching and learning are carried out in writing or through some other medium.
- Teaching is individualized.
- Learning takes place through the student's activity.
- Learning is made convenient for the student in his or her own environment.
- The learner takes responsibility for the pace of his or her own progress, with the freedom to start and stop at any time (Simonson, Smaldino, Albright, & Zvacek, 2012, p. 44).

While emphasizing the importance of learner autonomy and self-responsibility, Wedemeyer also stressed the importance of teaching presence. He suggested that placing greater responsibility for learning on the student freed faculty members from their custodial-type duties, enabling them to give more time to truly educational tasks. He advocated the employment of all teaching media and methods that had been proved to be effective so that every subject or unit within a subject was taught in the best way possible (Wedemeyer, 1981). He also foresaw that the increasingly ubiquitous instructional telecommunications would mean that the opportunities for, and processes of, learning would come to the learners and not only in their own state or region.

Another of Wedemeyer's major achievements was his Articulated Instructional Media (AIM) interdisciplinary Integrated Liberal Studies degree programme for adults, which he initiated at Wisconsin–Madison in 1964. An expansion of a residential freshman–sophomore programme, this involved a combination of short sessions, off-campus seminars and independent study using telelectures, radio television, programmed materials, mobile laboratories and libraries. It laid the foundations for 'a new type of institution … made possible through course design utilizing media and technology and … supported by counselling and resource and learning centres' (Sherow & Wedemeyer, 1990, p. 18) and is often credited with being influential in the establishment of the UK Open University.

Wedemeyer's work greatly influenced the subsequent theorists in the field.

Transactional Distance

Someone who studied under and worked with Wedemeyer at Madison was English-born Michael Moore, now Distinguished Professor Emeritus of Education at Pennsylvania State University. Moore's major contribution to thinking on distance education was his Theory of Transactional Distance (1972, 1973, 1983).

He postulated that distance education was not only characterized by the physical separation of the learners but a psychological and communication space. Within this space which he called 'transactional distance', he argued that there was great potential for misunderstanding between instructor and learner and the greater the transactional distance, the greater the responsibility placed on the learner. His major thesis was that this transactional distance could be bridged by instructional dialogue and that this would be beneficial to both learners and teachers.

At the time of his early work, the only available dialogic means in distance education, apart from frustratingly slow correspondence by postal means, were audio- and video conferencing. But Moore foresaw that highly interactive electronic media and computers would permit more intensive, personal, individualized and dynamic dialogue and that the nature of each communication media would have a direct impact on the extent and quality of the dialogue between instructors and students. But he was also at pains to emphasize that 'virtual dialogue' could be incorporated in print, an idea expanded in Rowntree's (1990) 'Tutorial-in-Print'.

For programmes to be maximally effective in overcoming transactional distance, Moore (1993, p. 25) argued that they needed to provide:

- Presentations of information, demonstrations of skills and models of attitudes and values.
- Support for learner's motivation, using various techniques of stimulation.
- Stimulation of analysis and criticism of course content by such means as discussions by teleconferencing.
- Advice and counselling in study skills and use of the learning materials.
- Opportunities for practice, application, testing and evaluation of the information and ideas provided and skills demonstrated.

For more details of the transactional distance theory, see Chap. 4.

Guided Conversation

Swedish-born Börje Holmberg was for many years Professor of Distance Education Methodology and Director of the Institute for Distance Education Research at the FernUniversität, Hagen, Germany. His early concern for the problems of non-contiguous interpersonal communication that can arise when teacher and learner are separated in time and place (Holmberg, 1960) led him to develop his theory of what he originally called 'guided didactic conversation' (Holmberg, 1983). Later, realizing that for many speakers of English the word didactic implied an authoritarian

approach and student subordination, which was the very opposite of what he had in mind, he renamed this 'a theory of teaching-learning conversations' (Holmberg, 2003, p. 42).

He observed that:

- The stronger the characteristics of guided didactic conversation, the stronger the students' feelings of a personal relationship between them and the supporting organization.
- The stronger the students' feelings that the supporting organization is interested in making the study matter personally relevant to them, the greater their personal involvement.
- The stronger the students' feelings of personal relations to the supporting organization and of being personally involved with the study matter, the stronger the motivation and the more effective the learning.
- The more independent and scholarly experienced the students, the less relevant the characteristics of guided didactic conversation (Holmberg, 1983, pp. 49–50).

He argued that in distance education contexts, such feelings and rapport could be fostered by the use of well-developed self-instructional materials and two-way communication systems, a moderate density of information in a colloquial language and conversational forms that are comparatively easily understood and remembered. To accomplish this, he recommended the use of the personal and possessive pronouns, advice and suggestions to the student on what to do, what to avoid and what to pay particular attention to (with the reasons) and invitations to exchange views and question what was being said. He also premised that guided didactic conversation could take two forms: simulated (self-checking exercises, review questions with model answers, inserted questions, etc.) and real (between tutor and student).

Two additions to the work of Moore and Holmberg, which is particularly applied to learning in the internet age are Pask's Conversation Theory and Garrison's Community of Inquiry Model.

In his Conversation Theory, English e*ducational theorist, cybernetician and psychologist* Gordon Pask (1975, 1976) also concluded that learning and teaching systems should be conversational in form and so devised that strategies are matched to individual competence. Based on his investigations into the cybernetic and dialectic processes involved in human interaction with computers and teaching machines, this scientific theory explains how *technology-based* interactions lead to the construction of knowledge. It illustrates how in peer-to-peer online learning, learners have the opportunity to learn about the others in the group, their learning behaviours and their relationship with the content and how to teach each other. He also demonstrates how such a symbiotic process also applies to human–computer interaction wherein the computer monitors the learners and tracks their progress while the learners gather information and explore ideas with the assistance of the technology.

Pask also discovered that the learners used three levels of conversation to explore and absorb the key concepts and ideas in a virtual learning environment: natural language (general discussion); object languages (for discussing the subject matter); and metalanguages (for talking about learning and language).

His studies into social connections in e-learning and online conferencing led Canadian D. Randy Garrison, now professor emeritus at the University of Calgary, to investigate the nature of interpersonal interactions within educational communities of inquiry. His collaborative constructivist Community of Inquiry (CoI) framework explains that learning in computer-mediated communication involves three overlapping presences: social presence (the participants' and tutors' personal characteristics, online communications and behaviour); teaching presence (the design, facilitation and direction of cognitive and social processes to achieve the learning outcomes); and cognitive presence (through which learners construct and confirm meaning through discourse and reflection) (Garrison & Arbaugh, 2007).

Adult Learning

American adult educator Malcolm Knowles developed a theory of what he called 'andragogy', the art and science of helping adults to learn. The word comes from the Greek ἀνδρ- andr-, meaning 'man' and ἀγωγός *agogos*, meaning 'leader of', as opposed to 'pedagogy'or 'leader of children'. He also believed that students should be *self-directed learners* and that the teacher's role should be that of facilitator of learning rather than teacher and procedural guide rather than a content transmitter. He posited that the learning plan design should focus on three elements: the learner, the teacher and the learning resources and a process within which individual learners, with or without the help of others, should take the initiative, define their personal educational needs and educational goals, select the appropriate methods and materials for their learning and self-evaluate the learning outcomes. He acknowledged that not all adult learners were natural self-directed learners and so they needed help in developing these self-directed learning skills (Knowles, 1975).

Knowles made four assumptions about the characteristics of adult learners (Knowles, 1980). And four years later, he added a fifth (Knowles, 1984), as below:

1. *Self-Concept*—Because adults are at a mature developmental stage, they have a more secure self-concept than children. This allows them to take part in directing their own learning.
2. *Past Learning Experience*—Adults have a vast array of experiences to draw on as they learn, as opposed to children who are in the process of gaining new experiences.
3. *Readiness to Learn*—Many adults have reached a point in which they see the value of education and are ready to be serious about and focused on learning.
4. *Practical Reasons to Learn*—Adults are looking for practical, problem-centred approaches to learning. Many adults return to continuing education for specific practical reasons, such as entering a new field.

5. *Driven by Internal Motivation*—While many children are driven by external
   motivators—such as punishment if they get bad grades or rewards if they get
   good grades—adults are more internally motivated.

These assumptions led him to propose four principles of adult learning (Knowles,
1984):

1. Since adults are self-directed, they should have a say in the content and process
   of their learning.
2. Because adults have so much experience to draw from, their learning should
   focus on adding to what they have already learned in the past.
3. Since adults are looking for practical learning, content should focus on issues
   related to their work or personal life.
4. Additionally, learning should be centred on solving problems instead of memo-
   rizing content.

The Application of These Theories in Today's Open and Distance Learning

The four theories outlined in this chapter rightfully hold a place in the history of
open and distance education. Many subsequent studies have confirmed that open and
distance learning is essentially a social interactive, constructive, self-regulated and
reflective process and the importance of developing autonomy, responsibility and
self-efficacy in the learners and a sense of connection and engagement with their
tutors and peers. The affordances of the Web and social media are providing further
opportunities for research and application of these theories.

There is widespread agreement on the importance of self-directed and adult learn-
ing involving 'the assimilation of new information, attitudes and skills into the exist-
ing framework of personally meaningful constructs' that lies at the core of lifelong
learning for personal or professional development (Candy, 1991, p. xix). Course
developers and instructional designers are aware of the need to address Vygotsky's
(1978) 'zone of proximal development', which he defined as 'the distance between
the actual developmental level as determined by independent problem solving and
the level of potential development as determined through problem solving under
adult guidance or in collaboration with more capable peers' (p. 86). They do this
by providing 'scaffolding', employing a variety of instructional techniques to guide
students progressively toward stronger understanding and, ultimately, greater inde-
pendence in the learning process, as first suggested by educational and cognitive
psychologist Bruner (1978).

Wedemeyer's theory of autonomy in learning, his preference for the term 'inde-
pendent study' rather than 'distance education' and his realization that in the future
the ubiquity of instructional telecommunications would lead to learning anytime
and anywhere and the consequent work of Moore, Holmberg and Knowles showed

great prescience. It is now being evermore widely recognized that much important learning occurs outside the lecture theatre and the classroom and that many of the learning systems, methods and materials employed in off-campus learning are equally valuable for on-campus students. But there is still a great need for more theoretical and empirical consideration of independent study, transactional distance, guided questioning and adult learning with the rise of such new modes of study as blended learning, flipped learning, massive open online courses (MOOCs), small private online courses (SPOCs) and distributed open collaborative courses (DOCCs). And as Siemens (2005) and Downes (2010) observe, in the age of the internet, with knowledge distributed across a network of connections, learners need to develop the ability to both construct and traverse these so that they can become largely responsible for how and what they learn and how they share and apply this learning. It is therefore important to keep on referring to, analysing and advancing these foundational theories to gain further insights into the use of such connective environments to scale-up quality education for millions in the developed and developing the world.

Gureckis and Markant (2012) accept the proposition that people learn better when the learning experience is under their control but offer a reminder that the reasons for this remain poorly understood. And like Knowles, they accept that not all learners are optimal self-directed learners and many cognitive biases and heuristics can influence how and what they learn. They posit that these issues can be investigated from both a cognitive and computational perspective. On the cognitive side, self-directed learning allows individuals to focus effort on useful information they do not yet possess, expose information that is inaccessible via passive observation, and through active engagement may enhance the encoding and retention of the new material. On the computational side, the development of efficient 'active learning' algorithms that can select their own training data is an emerging research topic in machine learning. Recent advances in these related fields may offer fresh theoretical perspectives, lead to a better understanding of the processes underlying self-directed learning and help to develop learning design methods attuned to the specific circumstances and characteristics of the individual learner.

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Chapter 3
The Industrialization Theory of Distance Education Revisited

Olaf Zawacki-Richter

Keywords Distance education · Economies of scale · Industrialization · Open learning · Organizational theory · Otto Peters · Systems approach

Background

The theory of distance education as an industrialized form of education was developed in the 1960s by Otto Peters, who was the founding rector of the FernUniversität in Germany, a position he held from 1975 to 1984. The creation of this new type of dedicated distance teaching university was a response to the growing demand for higher education at the time.

After World War II, educational systems throughout the world began the greatest process of expansion in human history. In the industrialized countries of the 1950s, barely 5% of a particular age group took up academic studies. In the following decade, student enrolment more than doubled in many countries and expenditures on education rose substantially. Today, more than half of all students proceed from school to university in OECD countries (OECD, 2017).

Despite the growth of student enrolment in the 1950/60s, a report that followed the 1967 UNESCO conference warned the international community that a "World Educational Crisis" was gathering force (Coombs, 1968, p. 4):

> Since 1945, all countries have undergone fantastically swift environmental changes, brought about by a number of concurrent worldwide revolutions – in science and technology, in economic and political affairs, in demographic and social structures. Educational systems have also grown and changed more rapidly than ever before. But they have adapted all too

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slowly in relation to the faster pace of events on the move all I around them. The consequent disparity – taking many forms – between educational systems and their environments is the essence of the worldwide crisis in education.

The 1967 report concluded that true innovation was needed and not just "more of the same" in order to meet the needs of a much larger and diversified group of learners and the introduction of national open and distance learning systems was an example of one such innovation. With a view from the 80s, Coombs (1985) praised the establishment of the Open University in the UK (OUUK) in 1969:

The Open University is perhaps the most outstanding example in recent times of a truly radical and fundamental educational innovation – not just a piecemeal innovation at the edges of the established system, but one that created a whole new teaching/learning system (p. 131).

Peters (2008) added that: "The Open University […] became famous for its open entrance policy, its focus on teaching adults, and for its extraordinary success in producing more graduates than all other universities of the country put together" (p. 227). Providing access to higher education opportunities is the *raison d'être* of open universities (Tait, 2008). The open universities follow a systems approach to enable mass higher education (Scott, 1995). Following the OUUK, many other national open universities were established throughout the world, such as Athabasca University in Canada (1970), Anadolu University in Turkey (1982), the Open Universiteit in the Netherlands (1984), Indira Gandhi National Open University in India (1985), and more recently, the National Open University of Nigeria (2002)—for an overview of over 70 open higher education institutions, see Zawacki-Richter, von Prümmer, and Stöter (2015).

A core problem, especially in higher education, was the rising cost per student and limited teacher productivity. Teaching is a highly labor-intensive exercise as Coombs (1985) points out: "Most other professions (for example, medicine, law, engineering) are organized on the basis of division and hierarchy functions […]. The teaching profession, by contrast, has no such hierarchy of functions and responsibilities" (p. 148). The introduction of distance education systems that are based on division of labor, and thereby provide opportunities for economies of scale, can be seen as part of a solution to this problem. This is where Peters' theory of distance education as an industrialized form of teaching and learning comes in.

Outline of the Theory

In order to inform policymakers in Germany, Peters carried out a comparative study of distance teaching institutions in more than 30 countries in the 1960s and 70s. This work laid the foundation for the establishment of Germany's distance teaching university, the FernUniversität in Hagen. Peters' theoretical and didactical analysis of distance education systems was first published as a 45-page monograph in 1967 and further developed in Peters' dissertation in 1973 (see Figs. 3.1 and 3.2). In the

Fig. 3.1 The original monograph in which the industrialization theory was published (Peters, 1967) (English title: Distance Education at higher education institutions—didactical structure and comparative interpretation, a contribution to the theory of distance learning)
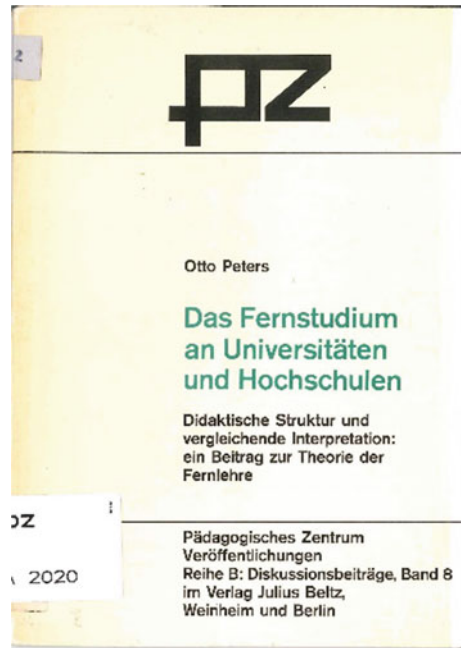
second part of the 1967 monograph, he proposed his theory of distance education as the most industrialized form of education in a "comparative interpretation" (p. 19).

Referring to Max Weber, who described structural similarities between research and capitalistic organizations, and Plessner (1924), who pointed out that mechanization, methodization, and depersonalization of the manufacturing process equally dominate the production of economic as well as cultural goods, Peters compared distance education with the industrial production process, emphasizing that the production of study materials in distance education is an industrial process in itself.

He used terms originating from business studies to analyze the industrial production process and applied them to distance teaching. Central elements are briefly outlined and illustrated here:

- Rationalization is based on division of labor in course development, the teaching process is detached from the person of the university lecturer, and technical equipment is used to deliver a course in constant quality to a theoretically unlimited number of students. The rationalization effect of mass production that enables economies of scale (Hülsmann, 2000) is evident here.
- Division of labor becomes apparent in the instructional design process, in which professional members of the instructional design team work in specialized functions (as subject matter experts, editors, media developers, project managers, etc.)
- Mechanization refers to the use of machines in a work process, e.g., machines are used to produce print-based learning materials and logistical transport systems are needed to send them to the students.

Fig. 3.2 Peters' dissertation (1973) submitted at the University of Tübingen (English title: The didactical structure of distance education, studies into an industrialized form of teaching and learning)

- Preparatory work, planning, and organization are applied.
- Scientific control methods are applied to systematically evaluate the quality of study materials and the learning and teaching process itself.
- Formalization and standardization of communication and assessment (e.g., through frequent use of multiple choice questions) are used to address a large group of students.
- Concentration and centralization are prevalent in many national distance education systems, where often a single institution is responsible for distance teaching that centrally manages a network of study centers throughout the country.

Based on these considerations Peters (1967) proposed the following definition of distance education (translated in Peters, 1983):

> Distance study is a rationalized method – involving the division of labour – of providing knowledge which, as a result of applying the principles of industrial organization as well as the extensive use of technology, thus facilitating the reproduction of objective teaching activity in any numbers, allows a large number of students to participate in university study simultaneously, regardless of their place of residence and occupation. (p. 111)[1]

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[1]The original wording was as follows (Peters, 1967): "Das Fernstudium ist ein arbeitsteiliges und rationalisiertes Verfahren der Wissensvermittlung, das infolge konsequenter Anwendung von Organisationsprinzipien sowie weitgehender Nutzung technischer Mittel und der dadurch in beliebiger Zahl ermöglichten Reproduktion von objektiviertem Lehrverhalten zur gleichen Zeit einer großen Zahl von Studenten ohne Rücksicht auf deren Wohnort gestattet, am Universitäts- oder Hochschulstudium teilzunehmen" (p. 41).

A key point here is that the application of industrial practices and educational technology would result in higher quality at lower costs, thus providing increased access to (higher) education learning opportunities.

Reception of the Theory

Peters' work was first published in a book by Mackenzie and Christensen (1971) and became widely known through Keegan's (1986) book, *The Foundations of Distance Education*, which included a whole chapter on the industrialization of distance education. In addition, all major writings of Peters were introduced in English in Keegan (1994)'s edited volume titled *Otto Peters on Distance Education—The Industrialization of Teaching and Learning*.

Open universities are the most industrialized form of educational institutions. Thus, the theory was most convincing to policymakers and administrators, who were responsible for establishing and managing these newly founded institutions in the 1970s and 1980s. The theory has been widely accepted in the distance education community and included in most of the major textbooks (e.g., Cleveland-Innes & Garrison, 2010; Moore & Kearsley, 2005) or handbooks on distance education (e.g., Evans, Haughey, & Murphey, 2008; Moore, 2007).

However, Peters' interpretation of distance education as an industrialized form of teaching and learning was the subject of controversial discussions among educators. For example, Haughey, Evans, and Murphy (2008) criticize:

> While Peters' delineation which focused on the production of materials and the infrastructure supporting their provision was helpful in explaining the development of distance education institutions as reflective of contemporary industrial society, it avoids the issue of the pedagogical assumptions underlying such a model […] (p. 5).

Such a view on Peters as a technocrat rather than a pedagogue and humanist, whose vision is to bring more equity and equality of educational opportunity, led Peters to write an article in Open Learning, in which he responded to such misunderstandings: "I do not want to dehumanise the instructional process in distance learning" (Peters, 1989, p. 3).

Almost 30 years later, referring to Haughey et al. (2008)'s quote, Peters again emphasized in a personal conversation that (February, 2018):

> I developed the Industrial Model for a better understanding of the "education" in distance education. The focus was always on educational changes. The statement of these authors is also contrary to what I have been constantly aiming at and written many times. Being a professional pedagogue, specialized in theories of teaching and learning, my main intention was just to make readers aware of the deep and radical pedagogical changes caused by industrialization. My focus was not on characterizing industrialization per se, but rather on revealing the extraordinary changes of teaching and learning in completely industrialized systems. I have not advocated industrialization of teaching and learning themselves, but tried to describe new and entirely unusual pedagogical possibilities and challenges of instructional design. My principal motive was a pedagogical one, my challenge was the extension and improvement of the educational system by the inclusion of distance education.

Relevance of the Theory in the Era of Digital Transformation

One could make the point that the industrialization theory of distance education might no longer be valid in the digital age. Theorists like Ulrich Beck, Anthony Giddens, and Manuel Castells argue that industrial societies have transformed to postmodern information, knowledge or network societies on a global scale since the 1970s. In this regard, Peters (2007) writes

> However, if we look deeper we become aware that the original approaches and many processes of industrialization are still changing our world, even at an accelerated pace and with far-reaching critical consequences. We have experienced the periods of neo-industrialism and of post-industrialization. Now many of these industrialized processes are changing as a consequence of their digitization. In spite of these stages of transformation, these industrialized production processes were not discontinued, but only modified structurally. These periods have not substituted each other but remain side by side (p. 61).

In fact, many elements and approaches that Peters described as basic principles of industrialization remain relevant also in the era of digital transformation. With the rapid increase in the size of "traditional" universities, and the introduction of mass higher education, Bates (2008) makes the point that "even conventional universities and colleges [are forced] to adopt many features of an industrialized or Fordist organisation model" (p. 228), such as large class sizes and lectures for hundreds of students, differentiation and division of labor between tenured (research) professors, lecturers, management (deans, associate deans, vice-presidents, etc.), and administrative staff, hierarchical organizational structures, and bureaucratic procedures. This development of higher education expansion is still continuous and ongoing.

In emerging economies, such as in Brazil, China, India, and Turkey (see Qayyum & Zawacki-Richter, 2018; Zawacki-Richter & Qayyum, 2019) the enrolment growth rates are overwhelming because private distance education providers fill the gap, where public institutions are too slow to respond to the huge demand (Litto, 2018).

The growth of the higher education sector is continuing in economically advanced countries as well, where access to conventional higher education has increased dramatically over the past 50 years, which might have reduced the need for open access. However, there is an increasing number of learners who seek flexible learning opportunities without interrupting their careers. Thus, most higher education institutions now offer programs online that they label as blended or flexible learning. Massive Open Online Courses (MOOCs) are also a new phenomenon of the last decade (Bozkurt, Akgün-Özbek, & Zawacki-Richter, 2017; Cormier, 2008, for an overview of MOOC research).

Furthermore, online distance education is a way to reach international target groups in the global education market. In Australia, for example, online degrees are the most important export good in the service sector (Latchem, 2018).

With the emergence of online learning, distance education clearly moved from the periphery into the mainstream of higher education provision (Xiao, 2018). However, the large-scale introduction of online learning is an enormous process of change and innovation. Many traditional campus-based higher education institutions are

struggling with the implementation of online learning programs and the lack of professionalism and appropriate organizational structures for instructional design, online course delivery, student and faculty support. They are now leapfrogging from the preindustrial organization, in which the teacher is responsible for all aspects of teaching and knowledge is handed down from the professor to the student in a lecture, to the digital- or knowledge-based organization. This is challenging, because the development, operation, and management of digital learning infrastructures, courses, learning materials, and assessment is a complex matter that requires systemic and "industrial" approaches, such as specialization and division of labor in professional instructional design teams, much of which has yet to be adapted and integrated in an online university setting (Bates, 2008).

In this context, Peters' theory is still very relevant to build upon the systems approach to distance education that enables a professional implementation and management of (national) digital learning systems and provides flexible learning opportunities for very large numbers of students, especially in developing and emerging economies, where the "world education crisis" has not been overcome.

Conclusion

Peters' theory is a fundamental contribution, that helps to understand the organizational structure and key components of massive scale distance education systems as well as new forms of mediated teaching and learning. With the rise of web-based learning, distance education moved into the mainstream of higher education provision, blurring the boundaries between conventional distance education and campus-based institutions. The transition to networked and digital modes of delivery is a tremendous challenge for all educational institutions.

In organizational studies, the elements of the industrialization theory can help to review and improve our educational systems and institutional organization of distance education provision, for example, with regard to the division of labor in multidisciplinary instructional design teams, the organization of quality assurance systems or the question of the advantages and disadvantages of centralized versus decentralized services to support innovation, development and delivery of distance education.

Online distance education shares roots with many of the characteristics of older forms of distance education. In order to prevent us from reinventing the wheel, "conventional" institutions can learn from the theory, history, research, and practice in the field of distance education (for an overview see Zawacki-Richter & Anderson, 2014; Zawacki-Richter & Naidu, 2016). This heritage should not be lost.

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Chapter 4
The Theory of Transactional Distance

Rick L. Shearer and Eunsung Park

Keywords Autonomy · Dialogue · Educational transaction · Knowledge creation · Structure · System dynamics · Transactional distance

Introduction

The theory of transactional distance proposed by Dr. Michael Moore (1980, 1993) is one that has stood the test of time and a host of technological innovations employed in the delivery of distance education. At the core of the theory is the notion of an educational transaction, which is bound by three distinct variables: dialogue, structure, and autonomy. Each of these variables plays a role in the effectiveness of the educational exchange and together they determine the transactional distance (TD) at any point in time for each individual. However, the educational transaction is more than a simple transfer of information or content; it is an exchange that helps build personal and/or group knowledge around a particular subject or topic of study. Thus, it is a theory that embodies the personal experience of the learner and one that is dynamic as explored by Saba and Shearer (1994, 2018).

Over the years, many studies have explored the idea of TD in distance education. These range from studies that have examined the theoretical premises of the TD theory, to ones that have explored the theory through different technologies, and those that have looked at the affective notion of feeling connected. However, many of the studies have tried to examine the idea at a class level and not at the intended

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individual level, which is key to the theory. Similarly, studies have viewed it as a cause-effect relationship instead of a systems framework that Moore envisioned, and it is important to recognize that it is not a theory that predicts the achievement of learning outcomes. This chapter discusses the evolution of the TD theory and its key variables, and explores how the theory has been refined within the online learning context.

The Theory of Transactional Distance: History and Evolution

The notion of a transaction implies an exchange of some sort whether that be money, goods and services, or in the case of education, an exchange of ideas through dialogue. Combining the idea of a transaction with the notion of distance and studying it within education, we have an exchange of ideas and concepts that occur at a distance (Shearer, 2010). More specifically, it is an exchange in education that leads to the construction of knowledge. Moore's (1993) notion of TD evolved from the work of Dewey and the work by Boyd and Apps where they discuss that "[transaction] connotes the interplay among the environment, the individuals and the patterns of behaviors in a situation" (p. 22). Further, Moore's thinking around the concept evolved through rigorous observations of independent study and correspondence courses.

Central to the theory are the concepts of dialogue, structure, and autonomy and it is the interaction of these variables that determine TD at any given point in time during a course. As Moore (1980, 1993) proposed and as depicted by Saba and Shearer (1994), the interaction between dialogue and structure are primary to the theory; as dialogue increases structure decreases, thus reducing TD. These variables are further affected by one's sense of autonomy, and it is possible that a highly autonomous learner may not actually need a high level of dialogue to reduce TD. However, this is still open to debate and further research.

In Moore's (1980, 1983, 1984) early works he defined the three key variables of the theory as follows:

Dialogue

…the extent to which, in any educational programme, learner and educator are able to respond to each other. This is determined by the content or subject-matter which is studied, by the educational philosophy of the educator and learner, and by the environmental factors, the most important of which is the medium of communication (Moore, 1983, p. 157).

In this definition, the focus is on the individual and does not include group interactions and the type of dialogic exchanges one sees today in our online courses. However, Moore (1993) later adjusted this definition to include the impact of dialogic

exchanges within a group that contribute to the construction of knowledge individually and within a group. In his 1993 definition of dialog, Moore included the idea that dialog is purposeful and focused on the construction of knowledge in a trusted and valued exchange between all parties. Thus, the underlying constructs of the theory were always very learner-centered, and in some ways highlight the shift from the behavioral-cognitive pedagogical approach in DE to a more social-constructivist or learner-centered approach as discussed by Anderson and Dron (2011).

A study conducted by Shearer (2010) that explored what we mean by dialogue in online learning environments built upon the ideas of Moore (1993) and Burbules (1993) and defined dialogue as

> an educational exchange that involves two or more interlocutors. It is marked by a climate of open participation, and is an interaction or series of interactions that are positive. These interactions are purposeful, constructive, and valued by each party and lead to improved understanding of the students (Shearer, 2010, p. 76).

Thus, within a dialogic exchange, whether at a distance or face-to-face, it is a trusted exchange of ideas and questions that persist in the face of disagreement, confusion, and misunderstanding, and is guided by a spirit of discovery that helps build knowledge and understanding. In this context, it is important to see dialogue as a very distinct subset of the broader spectrum of educational conversation that unfolds within distance education environments, especially in online environments.

Structure

> … the extent to which the objectives, implementation procedures, and evaluation procedures of a teaching programme are prepared, or can be adapted, to meet specific-objectives, implementation plans, and evaluation methods of individual students. Structure is a measure of the educational program's responsiveness to the learner's individual ideas (Moore, 1980, p. 21).

Moore (1984) further clarified structure by stating that to the extent a program "consists of pre-produced parts, at least in the form of particularized plans listing item by item the knowledge and skills to be covered by the programme" (p. 80), the program may not be responsive to the learners' idiosyncrasies and the resultant structure is high.

As we explore the notion of the structure set forth by Moore and examine most online courses, it is difficult to identify many that do not have a fairly high degree of structure. In most cases, the sequence of content, activities, and assessments are set and there is no room for negotiated differences. Even today with multiple technologies that allow for richer and deeper dialogue, if courses remain highly structured then we must ask if what we are seeing is a true dialogic exchange related to the negotiation of an individual's learning path and/or knowledge building. Or are we only observing online posts at the lower levels of Bloom's taxonomy or within the Practical Inquiry Model (PIM), as discussed by Garrison, Anderson, and Archer (2003) and Schreck (2011), wherein terms of knowledge building only triggering

and exploration type posts are witnessed, and the elements of integration and resolution are missing. Thus, we may not observe high levels of actual dialogue and it is possible in our online courses that the notion of high TD remains and the conceptual notion that as structure increases then dialogue decreases also remains.

Autonomy

Autonomy is likely the most elusive of the three variables in terms of a solid operational definition and it is the most difficult to understand and internalize within the theory. Moore (1972) built the definition of autonomy upon Carl Rogers' idea of learner autonomy that was described as a degree to which a learner has a learning plan, internally or externally finds resources for study, and evaluates for themselves on how much they learn. Moore stated

> The autonomous learner turns to teachers when he needs help in formulating his problems, gathering information, judging his progress, and so on, surrendering temporarily some of his learner autonomy … However, if he is a truly autonomous learner, he will not give up overall control of the learning processes (Moore, 1972, p. 81).

Within Moore's definition of autonomy, we see aspects of metacognition, self-directed learning, motivation, and learning control. These are elements that were further highlighted in the work by Garrison and Baynton (1987) where they reference the concepts of a learner's power, control, and support.

While autonomy and structure have not received as much attention in the research as dialogue, some current studies have reviewed the concept of autonomy and defined it as the degree to which a learner controls his/her learning process including setting goals, planning, and evaluating for knowledge acquisition. Autonomous learners have higher strategic competencies and decision-making skills to solve a problem (Hurd, Beaven, & Ortega, 2001). Therefore, autonomy is not inherent, it is personal trait which is able to evolve through practice. However, Fotiadou, Angelaki, and Mavroidis (2017) further called attention to the implication of autonomy that involves a state of interdependence between a learner and an instructor highlighting the continuous support by the instructor to the learner.

Critiques of the Theory

Since the emergence of TD as an accepted theory in 1993, it has received limited critiques. It is probable that the best known is the work by Gorsky and Caspi (2005) where they argued that the concept of TD may be a tautology between dialogue and TD, and thus dialogue is the sole determinant of TD. Here it is assumed that all other variables determine the level of dialogue, which at face value has some legitimacy. However, this concept of TD may limit our view of how other variables like learner

control, and autonomy impact how a student chooses to engage within a course, and thus the resultant level of TD. For example, if a student is a highly autonomous learner s/he may not require a high level of dialogue, and yet the overall level of TD for the student is low as s/he still feels connected to the overall experience. Dron's (2005) critique also highlights one of the fundamental challenges of exploring and testing the theory, which is the ongoing fuzziness of the operational definitions. This vagueness was again highlighted in a study by Giossos, Koutsouba, Lionarakis, and Skavantzos (2009) where they discuss the lack of well-defined operational definitions around the key variables of the theory.

Further, several studies look at the notion of satisfaction and TD to determine if students feel low TD. These studies fail to acknowledge the systems view of the theory and fail to address that TD is more than just the feeling of not being isolated through physical distance. However, we should continue to examine the fundamental questions about the theory because only by constantly challenging and testing the theory can we come to a deeper understanding of the nuances that may exist in an educational exchange at a distance.

Continued Refinement and Quantification of the Key Variables

If TD is the sum of the three independent and interacting variables, then we need to measure these variables and examine the impact on the dependent variable TD, and not simply measure the construct or concept of it. So, how do we better operationalize the variables and define them in such a way that they can be measured beyond inventory scales, surveys, or self-reports? While the work by Moore (1993), Burbules (1993), and Shearer (2010) have provided a good foundation for what constitutes dialogue, more needs to be done around the constructs of structure and autonomy.

If the structure in a course, as defined by Moore (1980, 1984), is predetermined by the faculty and the sequence of content, types of assessments, and learning objectives are not negotiable by individual students, then the level of the structure remains high as it is not responsive to a learner's needs. In other words, we could view a course with the high structure as one with high instructor control and low learner control. Also, it is a course where dialogue would not impact structure at the individual level. Relating this to the work of Saba and Shearer (1994) we would see structure increase exponentially and the other variables remain low.

In the examination of many of today's online courses, what we would likely observe is a high structure (predetermined objectives, sequence, assessments, etc.) and possibly moderate dialogue. But, are the educational exchanges all dialogic around knowledge building, as described by Shearer (2010), or are only a subset of the interactions dialogic? Do we observe any educational exchanges around the negotiated structure of a course at the individual level? Further, if the dialogic exchanges remain at the triggering and exploratory level, does this impact our view of dialogue?

It may also be the case that if we examine the notion of structure and dialogue through the lens of the systems model, one could hypothesize that the dialogic exchanges should be about the negotiation of the structure of the course and not necessarily around understanding the content as we view today. In other words, in our current courses what we may be witnessing is high levels of instructor control and low levels of learner control.

Thus, what is missing in our courses today that would truly allow for the notion of TD to be explained through the interaction of dialogue and structure, in the way Moore described them around the early forms of correspondence/independent study courses? It could be hypothesized that what is lacking is the negotiation through dialogue, as the course unfolds, of the individual learning path that a student or a small group of students would like to pursue. Therefore, while we may start with a predetermined sequence and outcomes, they should not be set in stone but should be dynamic and negotiable as the course develops. In this scenario, learner control is increased and impacts both the dialogic exchanges around the structure and also the dialogic exchanges around knowledge building. In this case, as these two dimensions of dialogue increase both structure and TD decrease.

This line of reasoning highlights that we may actually have two elements to the dialogic variable: one around negotiation of the learning path, and the other focused on exchanges around knowledge building. So, while the work by Shearer (2010), Burbules (1993), and Moore (1993) helps us understand what is considered as dialogue for knowledge construction, we need to determine what elements of the educational exchange would be identified as dialogue around the negotiation of the structure. Would these elements be related to what Saba and Shearer (1994) described as classroom management speech acts, and would we see these types of dialogic exchanges throughout the course or only at the beginning?

Autonomy is possibly the most difficult concept to define and operationalize for studies that are examining the theory of TD. If we conceive of autonomy as learner control and as a variable that encompasses the notions of independence, motivation, self-directed learning and a sense of one's metacognition, then it is a highly individual measure and one that is complex. It is also one that is dynamic throughout and across courses. It depends on our life experiences, prior learning, and comfort with particular topics. Thus, as a student moves through a course, they may move back and forth along a continuum of autonomy. At one moment, they may desire a high level of independence and have the ability to negotiate the learning path and activities and in the next unit or lesson wish for more structure/less learner control. Thus, the degree to which a learner is autonomous varies depending on the time, subjects, activities, and power dynamics in a course.

Further, while Moore focuses on individual factors as important for autonomy, Goel, Zhang, and Templeton (2012) point out a distinction between the nature of the perception of autonomy in different contexts (e.g., online or face-to-face) and in the general levels of autonomy that an individual may perceive. For example, individual traits that affect the preference of autonomy may be influenced by one's level of familiarity with technology (Goel et al., 2012, p. 1124). Thus, there is a need

to better operationalize the concept of autonomy so it can be measured by the key elemental characteristics, which define it.

Conclusion

The theory of transactional distance is at once all-encompassing in our view of education at a distance. It is a theory that is broad and thus requires investigation and critical analysis to determine if it still has relevance as our technologies evolve and our pedagogical approaches change. As with all theories, it needs to be tested through different lenses. However, as discussed by Dron (2005) "transactional distance theory applies whether we like it or not and the relationship between structure and dialog is (at least in broad terms) immutable" (p. 322). But is it? Are our operational definitions of the variables still valid? As discussed above, in the broad sense, yes. However, further research is required in order to

- Better understand and operationalize structure and autonomy,
- Examine the two dimensions of dialogue around knowledge creation and negotiated learning paths (structure), and
- Explore how these revised definitions impact the theory and systems model.

By continuing to examine the key independent variables of TD, the theory will be enhanced.

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Chapter 5
Openness

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Introduction

Openness has been defined by a large portion of the literature and in my own writing (see for example, Deimann & Peters, 2016) as a complex sociopolitical term which is deeply interwoven with technology. It is related to other areas such as knowledge and communication systems, epistemologies, society and politics, institutions or organizations and individual personalities (Peters & Britez, 2008). Openness has been described as "one of the supreme declared social values of our time" but the practical methods to open up education have changed considerably over the years (Lynch, 1975, p. 448). Whereas in the 1970s, there was a strong emphasis on a "free-flowering individualism" which "repudiated any involvement in socialization processes and rejected the inhibiting and constraining use of any social models in the educative process" (Morgan, 1974, p. 278), nowadays openness is subjected to political goals framed by a neoliberal agenda (Hall, 2013).

Openness is also associated with the notion of sharing along with the removal of barriers such as access to educational institutions and opportunities or as a remedy to educational inequality (Biswas-Diener & Jhangiani, 2017; Bonk, Lee, Reeves, & Reynolds, 2015). The latter has been linked to open educational resources (OER), i.e. materials with an open license and which are free of cost. Given that in some

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educational systems, textbooks are unaffordable for a certain population of students, OER-based textbooks are portrayed as valuable tools towards the goal of "education for all" (Wiley, Hilton III, Ellington, & Hall, 2012). Moreover, in the recently published "*Ljubljana Action Plan*",[1] mainstreaming OER is suggested to reach the UN Sustainable Development Goal 4: "Ensure inclusive and quality education for all and promote lifelong learning".[2]

However, the open education movement is also a striking case for a *normative paradox*,[3] i.e. a growing discrepancy between an original idea that is based on progressive values such as opening up education or removing barriers to education and the actual steps taken towards reform. Examples for such a reversal are massive open online courses (MOOCs) that are offered on commercial platforms. Although these MOOCs are open to all, there are restrictions on other components of openness such as the use of or access to materials and a reliable Internet connection.

Therefore, instead of arguing for a one-dimensional understanding of openness, which can easily fall into the trap of unintended consequences and paradoxes, a multidimensional perspective is suggested. Moreover, there is no simple automatism assuming that the more open, the better, but a process towards openness situated on different layers and to be negotiated in specific situations (Friedrich, Shah, Haydeyan, & Watolla, 2016).

The concept of openness is used in this chapter as an analytical tool to review its conceptual changes in a historical context of open and distance education (ODE)—from open admission and open access through open choices to open content and OER. It is also used as a measurement to discuss possibilities of expansion and refinement for ODE theories.

Changes in the Concept of Openness in ODE

As already stated above, openness has been understood differently throughout the various stages of ODE development, e.g. either implicitly as a *hidden value* for ODE or explicitly as a vehicle to support learning and teaching at a distance. Saba (2003, p. 4) examines ODE theories that focus on either industrialisation/post-Fordism as the operating mode for ODE or human agency or learner's independent learning and transactional distance as the fundamental features for ODE.

The industrialization theory with major contributions made by Otto Peters (Chap. 3 of the book) is often cited as one of the most dominant theories in ODE. Openness was not a major design principle in this theory but rather a closed-circuit

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[1]https://www.unesco.de/fileadmin/medien/Dokumente/Bildung/Ljubljana_OER_Action_Plan_2017.pdf.

[2]https://www.un.org/sustainabledevelopment/education/.

[3]Normative paradox is a concept with strong ties to the Frankfurt School and the work of Horkheimer and Adorno. In recent years, Honneth has elaborated on the idea to describe the paradox of capitalism (Honneth, 2004).

form of planning, producing and delivering educational materials to a remote audience. Opening up this circuit was perceived as a threat to the economy of the institution which had the role of a central hub. Consequently, Peters and other scholars were not interested in exploring the theoretical utility of openness.

The rise of the post-Fordism moment in the mid-1970s began to allow more flexibility in production and organization. However, it was still part of the "instructional industrialism" narrative (Evans & Nation, 1992) as there was little space for learning experiences in an almost entirely pre-planned environment. Even so, the term "open learning" which originated in the 1950s and 1960s and was actively advocated in the 1970s signalled an alternative to the restrictions of closed DE. The combination term Open and Distance Learning (ODL) is often used as a "reference to a philosophy of openness within a system that used multiple media for delivery" (Gaskell, 2017).

ODL is sometimes connected to a line of thinking that places human agency at the centre for theorizing DE, in particular, the work of Wedemeyer (1981). It is the autonomy and self-determination of the individual that is the key for bridging the spatial and temporal gap. Wedemeyer points out that "a learner does not have to be in a specific place at a specific time to enjoy opportunity and access for learning" (1981, p. xxii). In the open learning scenario, in contrast to typical DE settings, there is less guidance and it is the learners' control and responsibility to determine the time and the place to study. Therefore, it is a model of independent study ushering "a shift from the world of correspondence study dominated by organizational and administrative concerns, to a focus on educational issues concerning learning at a distance" (Garrison, 2000, p. 5). Taking on Wedemeyer's learner-centred approach, Holmberg's concept of guided didactic conversation and Moore's transactional distance also attempted to relate to the basic human need of belongingness in a way that is appropriate to the fundamental separation between learners and teachers.

Open Education Movements and Their Implications for ODE

The ODE community has more or less closely observed the rise of various open movements since the 1990s. The first example is open content, which was later repackaged into Open Educational Resources (OER). OER are defined as "teaching, learning and research materials in any medium—digital or otherwise—that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions" (UNESCO, 2012). While OER is becoming an important part of teaching and learning in the digital age, they have not been fully utilized by ODE institutions nor sufficiently integrated into ODE theories.

The second major manifestation of openness in education pertains to Massive Open Online Courses (MOOCs), which are delivered completely online to large cohorts of learners. MOOCs have grown at a rapid pace since their first appearance

in 2008. Their business model is based on free materials and paid-for services such as certificates. While we observe high growth rates of MOOC learners, courses and providers, neither ODE institutions nor ODE theories have systematically embraced MOOCs.

The lack of acceptance of OER and MOOCs in ODE should be conceived as a paradox because there are apparent ties among them. The longstanding impact of the industrialization model has shaped the way DE materials are produced, distributed and advanced. Therefore, it seems that ODE theories, models and practices have been trapped in a certain line of reasoning that privileges pre-packing, mass production and distribution of programmes and study materials. But at the same time, ODE has emphasized open access, a philosophy and policy striving to remove barriers in order to ensure equal opportunities for lifelong learners. As OER and MOOCs provide open access to educational opportunities that were hitherto available only to learners with the benefit of sufficient economic and social capital, ODE institutions should consider integrating recent open education movements into their educational systems as well.

However, as has been argued above, open education should not be regarded as a comprehensive, robust concept but rather as "forks"[4] that have originated from fundamental ideas such as education as knowledge commons (as seen in OER) or education as a start-up (as exemplified in MOOCs).[5] The next section will look at major ideas of OER and MOOCs and discuss how these open education manifestations can be used to improve ODE theories and models for the digital age.

OER as the True Foundation for ODE

Access to knowledge represents a constitutional element of any type of education. ODE has exerted much effort into the organization of the production, distribution and storage of knowledge using various media. Even though the media and educational technologies have changed and free open materials appeared over the years, the legal constitution of knowledge has remained the same and ODE institutions carried on with their business under the regulations of copyrighted materials.

OER provides a major developmental step towards more openness in ODE as they legalize the reuse and repurpose of educational materials. Given the constitutional function of universities as knowledge creators, curators and distributors, a free licence is an important part of fulfilling that role. ODE institutions can implement OER in their pool of resources, provide additional materials and become more supportive for

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[4]Fork is a term used in software engineering (see https://en.wikipedia.org/wiki/Fork_(software_development) but can also be employed for social relations and society in general.

[5]Clay Shirky has outlined this line of reasoning in his blogpost "Napster, Udacity, and the Academy" (Shirky, Clay, "Napster, Udacity and the Academy", 2012. http://www.shirky.com/weblog/2012/11/napster-udacity-and-the-academy/).

different groups of learners. Moreover, OER can support ODE institutions' mission to widen participation and to foster social inclusion (Conole, 2012).

There are prominent examples of large institutions such as California State University with MERLOT[6] and MIT with OpenCourseWare[7] who have begun to capitalize on the new opportunities and share scientific resources and research data with specific open access policies and services. The motivation to open up materials at MIT was triggered by a discussion on the changed landscape of higher education in the late 1990s and MIT attempted to (re-)position itself within the ODE/e-Learning community (Bliss & Smith, 2017). The change of the business model, from protecting intellectual properties to opening up and sharing, led to a renewed interest in ODE practices. Traditional ODE institutions such as the Open University UK begun to seize upon the opportunity and adopted open practices and policies as they conceived OER as a natural fit to their initial mission. Other institutions such as the FernUniversität in Hagen (Germany) stuck to their initial business model and ignored the potential of openness for DE. This was motivated by the belief that OER do not challenge the way DE is conducted although in smaller projects the potential of OER was investigated. Furthermore, OER is regarded as a threat because selling study materials provides a stable stream of revenue and reducing costs for textbooks is a strong driving force for the proliferation of OER (at least in North America).

OER as such are typically defined (e.g. by UNESCO or Hewlett Foundation) as all kinds of resources (not necessarily educational) that are licensed in a way so that they can be retained, reused, revised, remixed and/or redistributed (5R) under open licenses such as Creative Commons specific rights (Wiley, 2009). ODE institutions can use OER to build preparatory or introductory courses. There can be core curricular (e.g. mathematics) and additional informal resources (e.g. YouTube Videos) that can be combined with individual packages. ODE institutions can then decide whether or not they want to issue academic credit for those OER-based courses (Olcott, 2012). They could also use OER to build new modules, programmes or even entire institutions as seen in the OERu.[8]

MOOCs as a Vivid Playground for ODE

Although MOOCs have emerged within the academic culture and are offered by many universities (including ODE institutions) around the world, they are still located outside the core business of ODE. Since MOOCs are organized as loosely connected and shared events on the Internet around topics relevant for higher education, they can thus function as a playground to explore open online practices in the digital space. With MOOCs, openness can be realized at various levels. Of course, this openness could be a barrier for learners who are lacking digital literacy. ODE institutions could

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[6]https://www.merlot.org/merlot/index.htm.

[7]https://ocw.mit.edu/index.htm.

[8]https://oeru.org.

fill this gap by offering courses that are targeted at understanding the potentials of the Internet for individual learning processes at a distance. Furthermore, by using MOOCs, they could develop new types of ODE programmes and modules targeting a broader audience than their typical learner groups.

It may be true that MOOCs are nothing new for ODE (Baggaley, 2014). But MOOCs could offer the ODE community an opportunity to investigate the dynamics of techno-social systems and to learn how to utilize them for educational purposes in the digital age. What we need now is not an automatic rejection of MOOCs, but a careful examination of them based on curiosity for nuances that emerge throughout MOOC practices. While a study conducted by Zawacki-Richter and colleagues (2018) identifies a range of potential benefits of MOOCs for universities, there is still a need for more research on the intersection of MOOCs, ODE and socio-technological developments.

Conclusion: An Updated Framework for Openness in ODE

The recent strengthening of openness in education should be utilized as an opportunity to update ODE practices for the digital era.

First, the still strong focus on content in ODE can be augmented by adopting OER policies that are in line with the underlying mission of ODE which was developed in the 19th century. As has been demonstrated by the Open University UK, OER can be regarded as a logical consequence for ODE in the digital age because they ensure legally sound pedagogical practices based on open licences. The claim of putting the learner at the centre of ODE can be supported by using OER as OER allow a high degree of freedom so that learners can align the materials according to their individual needs. The pool of OER is constantly growing and combined with the existing, quality-ensured materials from ODE institutions promises a mix of instructional and raw contents.

Second, ODE practices that have been changed from the industrial to a post-industrial paradigm should be altered again to meet the demands and conditions of a culture of digitality (Stalder, 2018). The culture of digitality is based on three main characteristics: (1) the use of existing materials is promoted for the production of cultural objects (referentiality); (2) resources are made accessible and meanings are stabilized through a collective frame (communality); and (3) automated decision-making is emphasized to reduce information overload (the principle of algorithms). Building on further investigation of these characteristics, ODE institutions should become a reflective organization that is aware of their academic tradition and able to integrate the emerging culture of digitality for a broader and a more in-depth foundation. As has happened in the past, a look beyond the traditional boundaries of ODE is necessary.

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Chapter 6
Connectivism and Networked Learning

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Keywords Behaviorism · Cognitivism · Connectivism · Constructivism · Learning theories · Networked learning

Introduction

Learning theories describe the processes by which changes in knowledge, skill or behavior are brought about. While they are descriptive, learning theories are the basis of prescriptive theories of instruction and empirical studies (Driscoll, 2014, p. 24). In broad terms, three learning theories have been applied in many contexts including open and distance education (ODE): behaviorism, cognitivism, and constructivism. As much has been discussed and written about these theories, only a brief explanation of each will be introduced along with their limitations for understanding and developing recent networked ODE.

Behaviorism

At least three types of behaviorism have been observed in the history of behavioral psychology: methodological behaviorism argued in the work of John Watson, psychological behaviorism shown mainly in the work of Ivan Pavlov and Edward Thorndike, and radical behaviorism present in B. F. Skinner's work (Driscoll, 2014; Graham, 2015). Skinner, as a representative radical behaviorist, conceived of knowl-

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edge as a repertoire of behaviors and argued that "knowledge is action, or at least rules for action" (1976, p. 152). From his perspective, we see no need to mention a learner's cognitive process in understanding his/her knowledge acquisition and can define learning as changes in observable behaviors that result from interactions with environmental stimuli.

While behaviorism has made great contributions to instruction in general and to the modification and management of learning behaviors, it has also been criticized for several shortcomings. Winn (1990) points out the problem with a lack of assessment of the mental process that learners use during learning. Similarly, Driscoll (2014) indicates a problem in disregarding intrinsic motivation in explaining human behavior and the absence of an explanation as to how and why reinforcement works.

Cognitivism

Cognitivism, which emerged in the 1950s, began to examine the human mind. Information processing theory, one line of cognitivism, explains cognitive development as a process involving input, information processing, and output. When learning happens, new information (input) is processed in sensory or short-term memory and then stored in long-term memory to finally produce learned behavior (output) (Atkinson & Shiffrin, 1968). Various ways to increase attention, memory, and retrieval have been studied with this theory.

Schema theory, another line of cognitivism, focuses on the mental structure within the mind. It explains how a schema or a mental framework, processes, represents and organizes information (Richey, Klein, & Tracey, 2011). All information stored in schemata is packaged into categories or units, which are structured in such a way that is meaningful to an individual learner and can change as new information is acquired. The development of schemata and their connections have been highlighted for meaningful learning.

While cognitivism has intensely examined how knowledge is processed and stored in the mind, it has been criticized for comparing complex human mental functions to a simple computer's information processing model without being able to successfully explain them.

Constructivism

Constructivism is not a single theory as claimed by Driscoll (2014, p. 386), but constructivist theorists share a common epistemological assumption that is opposite to objectivism. While objectivism rooted in behaviorism and cognitivism views knowledge as external to the learner, constructivism assumes that knowledge is actively created based on personal experiences and social negotiations. Smith and Ragan (2005) introduce two kinds of constructivists. Individual constructivists, like Piaget,

define learning as constructing meaningful knowledge on the basis of personal experience whereas social constructivists, such as Vygotsky, see learning as a collaborative process of negotiating with multiple perspectives.

Constructivism has also been criticized. One common critique is that constructivism does not value what has been researched and validated. For example, a teacher-centered approach could be as effective as a learner-centered, collaborative approach depending on the learning context and learner experiences.

Issues and Criticism in the Context of Open and Distance Education

When applied in instruction, both behaviorism and cognitivism focus on how to transfer and teach new information to learners in the most effective manner for knowledge acquisition (Bednar, Cunningham, Duffy, & Perry, 1991). A well-designed environment and efficient knowledge processing strategies (e.g., attention, memorization and retrieval strategies) are the focus of these theories. For these features, both behaviorism and cognitivism have contributed to the development of individualized self-study materials for ODE learners and introduced cost-effective models for ODE institutions (Anderson & Dron, 2011). But both theories have significantly reduced teaching and social and cognitive presence and have thus failed to create a learning community of inquiry among ODE learners.

Constructivist models are also criticized that they tend to emphasize many features of campus-based education such as learner–teacher and learner–learner interactions and thus restrict accessibility in ODE. Siemens (2005) adds that social constructivism tends to place the individual and her/his physical presence in the center of learning and does not "address learning that occurs outside of people (i.e., learning that is stored and manipulated by technology)" (p. 5).

Siemens (2005, p. 5) raises a few important inquiries that question the appropriateness of the existing learning theories in the digital age such as:

- How are learning theories impacted when knowledge is no longer acquired in a linear manner?
- What adjustments need to be made with learning theories when technology performs many of the cognitive operations previously performed by learners?
- What is the impact of network and complexity theories and chaos as a complex pattern recognition process on learning?

These questions lead us to consider an alternative theoretical framework for today's networked and distributed learning environments.

Connectivism and Networked Learning

While there is still controversy surrounding connectivism being a theory (Boitshwarelo, 2011; Kop & Hill, 2008), it was proposed as an alternative theory for learning in the digital age by Siemens (2005) and Downes (2005). Siemens and Downes created the first MOOC in 2008 called "Connectivism and Connective Knowledge" based on their ideas of connectivism.

Epistemology

Connectivism is characterized as a network theory of learning that is based on the epistemology of connective knowledge. Downes (2006, 2012) describes connective knowledge as a third type of knowledge in the networked world in addition to the traditionally accepted two types of knowledge: qualitative and quantitative knowledge. Connective knowledge is created by interactions with people who are linked to various networks and thus is distributed across a web of individuals. In a similar vein, Siemens (2005) points out that "The starting point of connectivism is the individual. Personal knowledge is comprised of a network which feeds into organizations and institutions, which in turn feeds back into the network and then continues to provide learning to the individual" (p. 8).

Networked Learning and Learning Experiences

Connectivism uses a metaphor of the computer network and its nodes to explain the concept of learning. The networks are learning environments in the digital age which are constructed and used by learners to access, process, apply, and create information with the help of other people connected to the networks, databases, and machines. Learning occurs as learners explore and build connections with "specialized nodes or information sources" (Siemens, 2005, p. 7) in the networks. The focus of connectivist learning is to build new learning networks using both human and non-human sources along with technological resources to move beyond formal education systems. Learning occurs by participating in communities outside of classrooms and bounded systems (Anderson, 2016) and inside the networked- and community-based learning environment. The "capacity to know more is more critical than what is currently known" (Siemens, 2005, p. 7) and the capacity to build connections between fields, ideas, and concepts is the core skill for success in learning.

Key Features

As Tschofen and Mackness (2012) point out, a major difference between connectivism and other well-established learning theories lies in its focus on the networked and shared experiences that individuals from diverse backgrounds experience in distributed and open contexts. In such contexts, learners are connected to other learners via network technologies and engage in activities of accessing, processing, applying, creating and sharing information. While other learning theories focus more on individual learners' independent learning experiences, connectivism places a greater emphasis on connected and distributed learning experiences of individuals. Knowledge is seen as a collective endeavor in communities of learning.

To create dynamic communities, Downes (2012, pp. 371–372) identifies the four key components of *autonomy, diversity, openness, and interactivity (or connectedness) as follows*:

- Autonomy—individuals make their own decisions about learning goals, choose their own learning resources, and decide their own learning outcomes so that they can produce new knowledge autonomously.
- Diversity—individuals in the networked learning community have different features (e.g., in terms of language, culture, point of view, software and resource selection, etc.) and distinct sets of connections so that their participation in the community can produce new knowledge.
- Openness—people in the community can communicate freely with others within and outside the network and participate in community activities so that they can generate new knowledge without restrictions.
- Interactivity (connectedness)—people in the network are connected and engage in dynamic interactions with each other so that complex and unique knowledge can be produced.

The community should be structured, guided and managed so as to maximize learner autonomy and promote diversity and creativity among the learners. It should also allow maximum openness which removes barriers and encourages a free flow of ideas and artifacts to maximize interactivity. The role of educators should change from an instructor to a critical friend and co-traveler (Anderson & Dron, 2011), a facilitator (Downes, 2012), and a curator (Siemens, 2008) who guides learners with advanced knowledge and facilitates learner engagement and exploration.

Application of Connectivism in Recent MOOC Practice and Research

Connectivism has been employed in developing connected MOOCs or cMOOCs which emphasize networking and building a learning community. Bates (2014) observes a set of design strategies that current cMOOCs employ in practice: the use of

loosely linked social media (which support interactivity and openness), participant-driven content (which is possible when participants learn autonomously), distributed communication (which is possible in an open and interactive system and with diverse people), and self-assessment and peer feedback (which is possible in an open and connected environment). de Waard, et al. (2011)'s *MobiMOOC*,[1] Wiley's *Introduction to Openness in Education*,[2] Siemens' Personal Learning,[3] Wiley and Siemens' recent edX course, *Introduction to Open Education*,[4] and Siemens' edX courses on *Learning Analytics*[5,6] are a few examples of cMOOCs. But compared with structured content-based xMOOCs, cMOOCs are scarce. Ozturk (2015) analyses 49 MOOCs offered by a few major providers using her Connectivist Learning Environment Assessment Tool and reveals two important points:

- The knowledge structure of most MOOCs was not chaotic, nonsequential, complex, and contextualized as suggested in connectivism. In many cases, highly structured video lectures were the main source of knowledge.
- While learner interactions and collaboration were occasionally promoted, community participation within a MOOC and in its external networks was not observed.

Lack of designer/facilitator competencies, time constraints and heavy workloads, and a large number of students could be a few possible reasons to explain the difficulty in adopting connectivist principles in MOOCs.

Unlike other ODE theories discussed in this book, connectivism has just begun to be applied in recent MOOC research. One track of research involved learner perceptions and experiences in a connectivist learning environment. In a study to examine cMOOC learners' experiences and perceptions related to the challenges of connectivist learning, Kop (2011) revealed that at the early stage of the course, learners new to connectivist learning find it difficult to become engaged in various learning activities. The author also found that critical literacies needed for networked learning and confidence and competency in using digital tools are the key to success in connectivist learning. The study also showed that social presence is important to build active learning communities. Saadatmand and Kumpulainen (2014) suggest that cMOOC learners perceive various kinds of social interactions and networking via different kinds of social media as motivating and useful but also as time-consuming and sometimes frustrating. Self-organization and autonomy are indicated as two key skills for keeping up with the readings, contributing and sharing materials, maintaining motivation and interaction with other learners and engaging fully in community learning activities.

Another area of research focuses on the use of social media in connectivist learning. Based on the review of empirical studies on the effects of various social media

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[1] http://mobimooc.wikispaces.com/.

[2] https://learn.canvas.net/courses/4.

[3] https://openedx.lpss.me/courses/course-v1:NRC+NRC01+2016/about.

[4] https://learn.canvas.net/courses/4.

[5] https://www.edx.org/course/learning-analytics-fundamentals-utarlingtonx-link-la-fundx.

[6] https://www.edx.org/course/data-analytics-learning-utarlingtonx-link5-10x.

in MOOCs, Ripiye, Mackinnon, and Walker (2016) conclude that social media contributed to the augmentation of the MOOC learning experiences by encouraging and enhancing peer interactions and communications, resource sharing and informal and social presence despite some reports on feeling frustrated and overwhelmed. A study assessing the effect of informal activities promoted via social media found an increased amount of learning communities and a higher completion rate (Fidalgo, Lacleta, García-Peñalvo, & Esteban-Escaño, 2014).

Other studies attempt to elaborate on the concept of interaction and community building. Ravenscroft (2011) critically reviews the concept of dialogue in connectivist learning and proposes *dialectic* and *dialogic* dimensions from a social constructivist perspective. Wang, Chen, and Anderson (2014) propose a multilayer theoretical model titled Connectivist Interaction and Engagement (CIE) Framework to explain the interactions and cognitive engagement in connectivist learning contexts. Using the CIE framework, Wang, Anderson, Chen, and Barbera (2017) analyze participant interaction functions and patterns in a cMOOC and validate the framework as a useful conceptual model for understanding and analyzing the interaction in connectivist learning environments. Wang, Chen, and Anderson (2018) identify different types of interaction patterns and various structures of social networking using interaction data. However, to further refine and validate such key concepts of connectivism as interaction, social networking, and community building, more empirical studies are needed in diverse networked learning contexts.

Conclusion: Criticisms and Future Directions

We currently live in an environment where new information and the views and ideas of people from diverse backgrounds can be accessed via networks. This context offers opportunities for networked learning by connecting people to resources, machines and each other. ODE researchers and practitioners have found that connectivism is a new theoretical framework which can help them understand and support networked learning. However, some criticism has emerged. Goldie (2016) questions connectivists' claim on its "newness" based on the argument that Lev Vygotsky's social constructivism and Andy Clark's embodied, situated, and distributed cognition had already highlighted the networked and distributed nature of knowledge. Clara and Barbera (2013) indicate some epistemological and psychological problems of connectivism like the idea that connectivism underconceptualizes the role of the other, oversimplifies what interaction means and defines interaction as a state, not as a learning process. To address this criticism, future research and testing is needed to elaborate and clarify the key variables of connectivism, especially *autonomy, diversity, openness and interactivity* and their relationships based on empirical data. Even with a more developed theoretical framework, it is likely that connectivism will be one of the learning theories which can explain certain, though not all, aspects of networked learning (Goldie, 2016).

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Chapter 7
Social Construction of Knowledge and the Community of Inquiry Framework

Karen Swan

Introduction

The Community of Inquiry (CoI) framework was developed by three researchers from the University of Alberta who were interested in exploring the learning that took place among participants in computer-mediated discussions. Garrison, Anderson, and Archer (2000) grounded their thinking in Dewey's (1938) social constructivist notions, which placed inquiry at the center of the educational experience and a community of learners at the heart of inquiry. In the 20 years since Garrison, Anderson, and Archer first shared their model of the kinds of supports needed to develop a robust community of inquiry in online environments, online learning has grown to be a major factor in higher education and the CoI framework has come to inform research and practice in online and blended learning around the world.

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Community of Inquiry Framework as a Model for Social Construction of Knowledge

The CoI framework is a social constructivist model of learning processes in online and blended educational environments. Social constructivist theorists assert that meaning is primarily constructed through social interactions, hence that learning is essentially a social activity, and that our understanding of the world is constructed through communication, collaborative activity, and interactions with others (Vygotsky, 1978).

The CoI framework is a process model of learning in online and blended environments where the social construction of knowledge is made nontrivial by the separation of course participants in time and space. It assumes that, especially in higher education, worthwhile educational experiences are embedded in communities of inquiry composed of teachers and students, and that learning occurs within such communities through the interaction of three core elements: cognitive presence, social presence, and teaching presence (Fig. 7.1). The CoI framework is a dynamic model of the interactions among these core elements, which are believed necessary for both the development of community and the pursuit of inquiry in online courses (Swan, Garrison, & Richardson, 2009). The framework is seen as dynamic in that the relative import of the three presences and their elements changes as online courses progress. One might better imagine the three circles in Fig. 7.1 as constantly changing in size and overlap.

In the years since it was first used to describe the kinds of supports needed to develop a robust community of inquiry in online environments, the CoI framework has grown to inform research and practice in online and blended learning around the world. The three presences that make up the CoI framework are explained in the sections which follow.

Fig. 7.1 The CoI framework (adapted from Garrison et al. 2000)
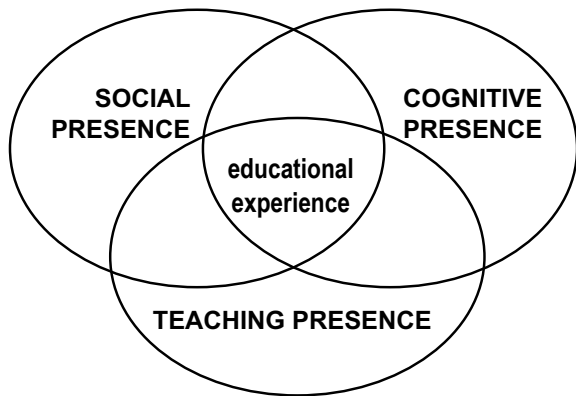
Cognitive Presence

In the CoI framework, cognitive presence is defined as the extent to which learners are able to construct and confirm meaning in a virtual community of inquiry (Garrison, 2016). Dewey (1933) described the complete cycle of reflective thinking as beginning with a problem, followed by five phases of reflective thought (suggestion, intellectualization, guiding idea, reasoning, and testing), and ending with resolution. This concept was the genesis for the Practical Inquiry Model which Garrison, Anderson, and Archer (2001) developed to describe cognitive presence in the CoI framework.

The Practical Inquiry Model is framed along two dimensions (Fig. 7.2). The vertical axis represents the psychological and sociological sides of the educational process identified by Dewey, the juxtaposition of the individual's private and reflective worlds with the community's shared world of discourse. Practical inquiry iterates imperceptibly between these two worlds. The horizontal dimension of the model describes the divergent processes of perception and analysis contrasted with the convergent processes of conception and synthesis. The points of perception and conception are points of insight and understanding. At each of these points, we see the fusion of the psychological and sociological and the unity of the educational experience that Dewey advocated.

More importantly, the Practical Inquiry Model describes four phases in the pragmatic inquiry process. Practical inquiry, according to the model, begins with a *triggering event*, in the form of an issue, problem, or dilemma that needs resolution,
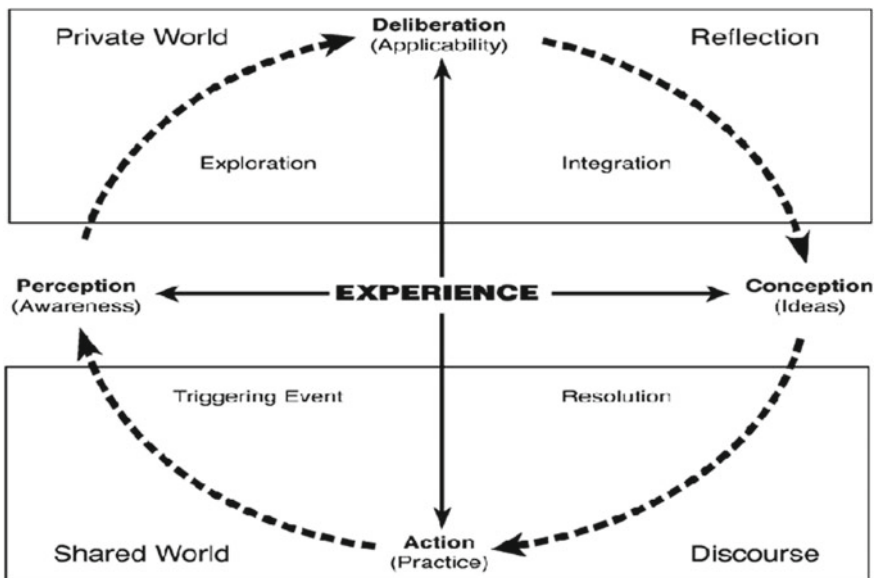

Fig. 7.2 Practical Inquiry Model (Garrison et al., 2001) © 2000, D. R. Garrison. Used with permission

which elicits a natural shift to *exploration*, the search for relevant information that can provide insight into the challenge at hand. As ideas crystallize, there is a move into the third phase—*integration*—in which connections are made and there is a search for explanations. Finally, there is the selection and testing of the most viable solution and *resolution* around it. The four phases described in the model are a telescoping of Dewey's phases of reflective thinking for the purposes of parsimony and understanding. Consistent with Dewey's rejection of dualism, the phases should not be seen as discrete or as necessarily progressing in a linear fashion. In the CoI framework, however, progress through to resolution is seen as evidence of critical or deep thinking.

Social Presence

In the CoI framework, social presence is defined as the ability of participants to project themselves socially and emotionally in an online class, and correspondingly their ability to perceive other participants in that class as "real" (Swan & Shih, 2005). It is the component in the CoI framework that supports the "social" part of the social construction of knowledge. The term "social presence" was originally coined by communications researchers who linked it to the capacity of various media to transmit the oral and visual cues which are an important part of face-to-face communications. Indeed, these researchers argued that computer-mediated discussion was a poor medium for the transmission of social presence and so a poor vehicle for learning (Short, Williams, & Christie, 1976). Happily, educators who were actually using such discussions in their courses disagreed, co-opted the concept, and focused it on participant perceptions, on how their students were, in fact, experiencing online discussion (Gunawardena, 1995; Richardson & Swan, 2003), rather than on the technical capacities of computer-mediated communication. It is important to note, however, that the concept of social presence predates the development of the CoI framework and consequently is conceptualized differently by differing scholars (Lowenthal & Snelson, 2017).

In the CoI framework, social presence is conceptualized as embodied by three types of behaviors—affective expression, group cohesion, and open communication. *Affective expression* involves the use of personal expressions of emotions, feelings, beliefs, and values to project presence. *Group cohesion* refers to interpersonal communication that builds and sustains a sense of community. *Open communication* includes behaviors that encourage interaction and critical reflection by recognizing, complimenting and responding to others. These three behaviors are thus seen as building on each other (in the order given) to create an environment that supports the social construction of knowledge.

Teaching Presence

Garrison et al. (2000) contend that while interactions between participants are necessary in virtual learning environments, interactions themselves are not sufficient to ensure effective online learning. Online interactions need to have clearly defined parameters and be focused in a specific direction, toward a particular goal; hence the need for teaching presence. Teaching presence includes course design and organization, the facilitation of learning, and direct instruction in online and blended courses. Although these are all tasks that are generally undertaken by teachers, in the CoI framework teaching presence is not seen as attached to them but rather conceptualized as distributed across teachers, students, and materials. In the CoI framework, the third element is thus "teaching" not "teacher" presence. It is seen by many as the critical presence, the presence without which the other two presences will not develop.

Garrison and Anderson (2003) identified three elements that contribute to the development of teaching presence in online courses—the design and organization of instruction, the facilitation of learning, and direct instruction—all of which deserve careful attention. The first category, *design, and organization*, cannot be neglected in an online learning environment, especially as regards the clarity and consistency of course organization and clear statements of goals and objectives. The selection of worthwhile collaborative and other learning activities is also an important part of course design. *Facilitating learning* is particularly focused on facilitating online discussion, where it is important to be supportive and present, but also applies to facilitating collaborative activities and encouraging individual student learning. There will, of course, be times when it is necessary to intervene directly in online discussions to correct misconceptions, provide relevant information, summarize the discussion, or provide some metacognitive awareness. This involves the third category of teaching presence, *direct instruction*, which also includes any lecture-like material included in online courses, as well as instruction included in feedback to students.

Other Presences

In the years since the CoI framework was first developed, researchers have proposed additional presences to address purported gaps in the model. The more important of these are *emotional presence* (Cleveland-Innes & Campbell, 2012) which sees all three presences as varying depending on students' emotional engagement, *learning presence* (Shea & Bidjerano, 2012) to account for the contributions of student intention to the educational experience, and *instructor social presence* (Richardson & Lowenthal, 2017) to acknowledge the "direct and significant effects" (p. 86) relationships with instructors have on student learning. It is interesting to note that these last two additional presences put the important actors—students and instructors (teachers)—and their actions back into the model. Although both these additions have

their proponents, Garrison (2016) maintains the sufficiency of the CoI framework as it stands and argues that any reconceptualization must be strictly validated.

Research on the CoI Framework

The CoI framework was originally proposed as a structure for studying discussion in online classes. Accordingly, early research in the area involved content analyses of such discussions looking for evidence of the presences in students' verbal behaviors. Content analyses of online discussions have supported the conceptualization of the three presences and given us insight into how they develop in online courses (Akyol & Garrison, 2008; Swan, 2003). It should be noted, however, that content-based evidence for the integration and resolution phases of cognitive presence has been thin (Garrison & Arbaugh, 2007). The identification of behaviors coded as cognitive, social, and teaching presence has also given instructors and designers ideas for enhancing their development.

A second common approach to using the CoI framework to study online learning involves survey research. Researchers studying social presence built on Gunawardena's (1995) original social presence survey to demonstrate its existence and link it to student satisfaction and perceived learning in online courses (Richardson & Swan, 2003; Swan & Shih, 2005). Similar survey research linked teaching presence to student satisfaction and perceived learning, and demonstrated its distributed nature (Shea, Li, Swan, & Pickett, 2005). A breakthrough for this approach came when several CoI researchers got together to create a survey that measured all the presences. The survey was refined through fifteen iterations, and the resultant instrument was validated at four institutions in the US and Canada in the summer of 2007 using confirmatory factor analysis (Arbaugh et al., 2008). Numerous studies have since supported this result (Garrison, Cleveland-Innes, & Fung, 2010; Kozan & Richardson, 2014). The final version of the survey (https://coi.athabascau.ca/coi-model/coi-survey/) consists of 13 teaching presence, 9 social presence, and 12 cognitive presence items, which include at least 3 items addressing each of the elements in each of the presences. In addition to confirming the CoI model, the development of this instrument made it possible to comparatively measure all the presences and to study the relationships among them.

The CoI survey has been translated into many different languages and used around the world to both study online learning and inform its practice (Ma et al., 2016; Yu & Richardson, 2015). Researchers using the survey have confirmed links among the presences; several investigations employing structural equation modeling have found that teaching presence has a direct impact on the cognitive presence and social presence, as well as an indirect impact on cognitive presence with social presence as a mediator (Kozan, 2016; Shea & Bidjerano, 2009). This common finding suggests that teaching presence is critical for the development of a community of inquiry. The CoI survey has also been used to uncover subject matter differences in student perceptions of the presences (Arbaugh, Bangert, & Cleveland-Innes, 2010) which

suggests differing values and structures of communities of inquiry in different academic domains.

Other researchers have used the CoI survey to explore the effects the development of the CoI presences can have on other educational outcomes. Ke (2010) found small to large correlations between various components of social, teaching and cognitive presence and knowledge–construction interactions. Ice, Layne, and Boston (2017) documented the important role social presence plays in student success, finding that two social presence items, and these alone, predicted 21% of term-to-term retention in an undergraduate population of over 50,000. Yang, Quadir, Chen, and Miao (2016) found that student perceptions of the presences had a significant effect on learning performance in a blog-based online course. Swan, Day, Bogle, and Matthews (2014) used student CoI scores to guide iterative improvements to core courses in a masters level educational leadership program resulting in significantly improved outcomes in three out of four courses. Other researchers have used the CoI survey to explore the effects of the use of various technologies on online learning processes (Lowenthal & Mulder, 2017).

Critiques and Future Research

There are, of course, critics of the CoI framework. Generally, critiques center on the cognitive presence constructs and both the absence of evidence of resolution in online discussion and inconsistent links between it and learning outcomes (Breivik, 2016; Maddrell, Morrison, & Watson, 2017). Future work around the CoI framework should surely explore this concept. Another issue involves confusion surrounding the social presence concept (Lowenthal & Snelson, 2017), which might be further addressed in the greater online learning community. The concepts of learner and instructor social presence should also be further investigated. Nevertheless, the CoI framework has demonstrated its worth in guiding research and practice around the world, especially in the context of studying and improving online courses and programs. Moreover, because one of the biggest strengths of the CoI framework, and the CoI survey, in particular, is the breadth and consistency in its application, scholars should be cautious and mindful in any changes to it that they consider.

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Chapter 8
Extended Space and Time in E-education

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Introduction

The purpose of this chapter is to revisit Jung and Latchem's model of e-education (2011) by updating the recent research on e-education pedagogy and adding the aspect of extended "time" to the previous discussion on extended space. Jung and Latchem purposefully chose the term "e-education" to represent both teaching and learning, which separates the role of teachers and students on the e-platform. The model highlights the interconnectedness of teaching and learning through the continuous loop of dialogue and reflection in both processes. In this chapter, I use the term "e-education" but focus more on the side of learning to include all aspects of the process that take place without explicit acts of teaching.

Review of the Extended E-education Model

The concept of space was the main focus of the e-education model in the 2011 article as "spaces are themselves agents for change, and changed spaces change practice." (Jung & Latchem, 2011, p. 11 citing Oblinger, 2006). The e-education model is briefly summarized below.

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Extended Teaching Space

Citing Fenstermacher and Soltis (2004), the authors discuss execution, facilitation, and liberation as components of teaching. In e-education, each of these components transforms and extends uniquely. First, execution refers to the traditional responsibilities and actions of teachers, which usually means, "providing the learners with knowledge and skills, setting the learning tasks, and defining the outcomes" (Jung & Latchem, 2011, p. 11). In the extended teaching space, execution is expanded through various instructional and technological tools that enable learners to work from home or any other places and spaces. Computer-based tutorials and other online assistance made possible by interactive ICT (Information and Communications Technology) tools help learners engage more through increased amounts of facilitation, the second component of teaching. Liberation is explained as an increase in the knowledge base, which offers increased opportunities for intellectual exchanges on the various online platforms.

Extended Learning Space

The model also discusses the way the extended learning space helps with three essential learning activities: acquisition, application, and construction. Multimedia resources and collaborative technologies encourage learners to acquire, explore, and discover information that can lead to increased motivation and engagement. The use of technology in the extended learning space provides expanded possibilities for application. The extended learning space also helps learners with the construction of learning communities. With the help of various technologies, the sense of community extends beyond the geographical proximity by allowing learners to navigate the physical and virtual spaces to create their shared network.

Dialogue and Reflection

In connecting the teaching and learning spaces, Jung and Latchem's model emphasizes the role of dialogue and reflection as a nexus for extended teaching and learning spaces. In other words, reflection and dialogue within and across the teaching and learning spaces serve as a communication loop that is necessary for their formative evaluation and subsequent redesign.

Limitations of the Model

While the model of e-education helps us understand the extended nature of teaching and learning online and offers specific, real-life examples for each aspect of the teaching and learning spaces, the model does not address the possible communication gaps stemming from two separate extended teaching and learning spaces and ignores the time dimension in e-education. The model's separation of teaching and learning spaces serves the purpose of emphasizing the connected but different responsibilities and roles of teachers and students in the e-education platform. However, the model gives the perception of a false dichotomy between learning and teaching. While the two might be separated spatially, the notion of extended time clearly captures the interconnected relationship between the teacher/teaching and learners/learning. In this sense, studies such as Kabat's (2014) explained in the later section provide a key connection.

Recent studies discussed below could help further explore these limitations of the model.

Research on Pedagogy in Extended Space and Time in E-education

Since the publication of Jung and Latchem's model (2011), many empirical studies have been carried out to investigate pedagogical strategies in e-education. These studies aim to explore the best ways to guide teachers and learners in the e-education platform's vastly expanded space and temporality. In particular, studies in the following three areas are relevant to understanding and improving the e-education model and help guide further discussions regarding the extended teaching and learning spaces: online learner competences, teachers' understanding of research and instructional strategies, and most notably, Massive Open Online Courses (MOOCs).

Online Learner Competences

Many studies commonly identify time management skills as one of the most critical components for successful online learning. For example, Beaudoin, Kurtz, Jung, Suzuki, and Grabowski (2013) share results of a global survey, which identified establishing daily and weekly schedules and routines for study tasks and assignments as critical for high performance in online learning. More broadly, however, several studies have focused on other attributes and competencies of the successful online learner in the extended learning space in e-education. Golladay, Prybutok, and Huff (2000) identify such attributes as high motivation, a positive attitude, a strong will to achieve, clarity in learning goals, internal locus of control and high expecta-

tions of success as key factors. Hong and Jung (2011) indicate self-directed learning competencies, cognitive and metacognitive skills, interactive and collaborative skills and management skills as important in online learning. Online learners' persistence, even when faced with various challenges and time conflicts, appears to be another key to success in the extended e-learning space as explained in studies by Fang et al. (2017).

Teachers' Understanding of ICT Pedagogy

Extended teaching and learning spaces rely heavily on the teacher's command of ICT-based pedagogy, which aims to find better platforms and technologies to create relevant and meaningful learning experiences grounded on students' daily lives and identities. The e-education model illustrates that the effective implementation of ICT-based pedagogy is often dependent on the training and professional development of the teachers. Recent years have seen many examples of ICT training for teachers from around the world and their effects on learning. A nationwide project of in-service teacher training on ICT-based pedagogy in Greece investigated the teachers' effective use and evaluation of ICT pedagogy in classroom instruction after the training (Amanatidis, 2012). Agyei and Voogt (2014) identified the positive effect of the professional development program in transferring the teachers' new knowledge of ICT-enhanced activities in their teaching practice in Ghana. Emphasizing the need for a curriculum reform based on ICT use, Khan (2014) proposes a model of integrating ICT into teaching and training based on TPCK (Technology Pedagogy Content Knowledge) using data from Bangladesh. All these studies indicate the importance of teachers' understanding of ICT-supported pedagogy especially in e-education environments where teaching and learning spaces are open and extend beyond confined classrooms.

MOOCs and Pedagogy

MOOCs serve as an extreme case of extended space and time, allowing for learning that is not confined to a specific time and location (Bonk, Lee, Reeves, & Reynolds, 2015). The very idea of massiveness can be exciting but also overwhelming to the instructors as they struggle to find the "right" level of engagement and support for such a diverse learner population (Evans & Myrick, 2015). While some consider MOOCs' pedagogy as not especially innovative (Armellini & Rodriguez, 2016), continuous efforts have been made by MOOC instructors and instructional designers to better address the challenges and opportunities of the massive open and online environment. One achievement from such efforts is the development of instructional design models, which address the open and expanded nature of MOOCs. For example, the Webscape model is proposed as a more student-centered, collaborative approach

in constructing Webscapes in MOOCs (Robin & McNeil, 2015). A Distributed Open Collaborative Course or DOCC model is also proposed as a feminist approach to MOOC development, which can accommodate the open, distributed, and diverse nature of such environments (Behmann et al., 2015). These examples emphasize the power of collaborative and distributed teaching that is created by the extended spaces in e-education.

Adding Time Dimension to the E-education Model

Extended space in e-education requires an extension of time and an equal consideration of its temporal aspect as indicated in several studies. For example, Chiu and Churchill (2015) argue that space and time should be discussed together in multimedia platforms and define spatial contiguity as "placement of essential description next to the corresponding picture" and temporal contiguity as "presentation of corresponding words and pictures at the same time" (p. 4). Asynchronous communication, an important part of most e-education platforms, is one good example of extended time. While communication during traditional classroom instruction is carried, out in a more structured duration and is equally distributed to all the participating learners in real time, asynchronous communication in e-education allows a much wider reach and variation of the time across learners (Dringus & Ellis, 2010; Peters & Hewitt, 2010).

Despite the importance of time in understanding e-education, the time component has received much less attention in research and even within those time-related studies, the focus was limited to the duration of discussion board activities, the logging of time/day for class participation (Kabat, 2014) and quantifiable, fixed manifestations of time. Kabat's work (2014) entitled *Time, Space, and Dialogue in a Distance-learning Class Discussion Board* is especially relevant and important to the discussion of this chapter as she focuses on the intersections of space and time with the purpose of "pinpoint[ing] the rhythms" (p. 162) of the students in an online context. Let us move on to discuss Kabat's spatiotemporal analysis and examine how her work offers some answers to improve the space-based e-education model.

Kabat (2014) aptly argues that "Without exploring time and space in the electronic environment, pedagogies cannot be formed, and ultimately the learning experience is not enhanced" (p. 162). Her focus on both space and time in an online learning context stems from the identification of the gap in research where the temporal component has not received as much attention as the spatial issue. Criticizing that the discussion on temporality has largely been limited to such topics as the duration, time management, procrastination, or preferred time/day for the online work, Kabat focuses on the "inseparability of time and space" (p. 164) and brings in Bakhtin's notion of 'time space' called chronotope. To understand "rhythms that the students themselves give" (p. 162) to online learning, she employed the spatiotemporal perspective in analyzing the online learners' discussion board activities and revealed findings that may inform and extend the e-education model. Some key findings from Kabat (2014) are:

- While space is seen as linear, time within the electronic space is perceived by the participants as a mixture of nonlinear and linear modes.
- There is momentum in the life of the discussion threads that is sustained by the flow of time. The momentum is manifested through peaks and drops of postings.
- Students prefer to respond to higher order thinking messages.
- Most students usually do only the minimum requirement of postings.
- The deadlines are interpreted and manipulated unconsciously by the learners following the learners' own temporal rhythm, which is under their control.
- Time lags are inconsequential and written silence does not affect productivity.

Kabat's work highlights the need to add the time dimension to the e-education model. While the e-education model by Jung and Latchem (2011) helps us understand the nature of e-education from a spatial aspect and offers pedagogical suggestions for instructors and learners in an extended e-space, it ignores the time dimension and thus does not offer useful suggestions related to temporality for efficient and effective e-education. Kabat's study leads us to propose the following pedagogical suggestions that are related to the extended time dimension in e-education.

First, as e-learners have their own temporal rhythm and tend to perceive time as both nonlinear and linear modes, they need to be given an opportunity to assess their own work and time usage patterns in the e-learning platform. A questionnaire could be useful for learners to conduct such time-related self-assessment. This kind of self-assessment conducted at the early stage of the course would encourage the learners to reflect more purposefully on their own work and time usage patterns, and plan accordingly for efficient and effective learning. Too often, the opportunities for the students to reflect only come at the end of the course and not at the beginning. While students' reflections can be used as a part of the instructor's summative evaluation for future course designs, an early self-assessment will encourage the students to understand their own learning styles and time usage patterns that can impact their actions and behaviors in that particular course.

Second, as e-learners have different work and time usage patterns, their differences should be reflected in designing or revising the assignments and activities. It is important for students to have awareness and clear expectations about the range of flexibility that is available. For example, students who have a full-time job can benefit from a Sunday night deadline. For students who set aside 1 h for the course during weekdays and have family responsibilities on the weekends, a Friday noon submission deadline could be more effective. The instructor can provide two different submission days but require the students' clear commitment for one from the beginning of the course. This means that the students have the flexibility of choice but their commitment for one is required. The key is for the students to have an awareness of their best temporal patterns in the course and opportunities to communicate these patterns to the instructor with a resulting sense of control through this availability of options. For the instructor, differentiated submission dates could help with a distributed load of grading that can result in more timely feedback.

Finally, as extended time in the e-education context makes it difficult for both teachers and learners to have the same assumptions on communication, a clear norm

and preference of communication should be established in advance and shared among the members. Crucial to successful teaching and learning experiences in e-education is establishing a clear, shared norm of communication, in terms of the preferred mode and frequency and regularity. The diversity of learners means a difference in styles of communication that are often guided by cultural and individual factors. Among these diverse learners, different assumptions about and understandings of temporality often result in unrealistic expectations of a 24/7 online presence of the instructor. It will be useful to present any necessary ground rules, which can include a preferred mode and expectation of communication. It could also be helpful to develop a list of explicit common online communication etiquettes when working with learners with diverse backgrounds and different levels of online experiences.

Concluding Thoughts

Since the publication of Jung and Latchem's e-education model (2011), continuous efforts have been made through research and investigations to facilitate teaching and learning in the extended spaces. The three areas of particular relevance are online students' competencies, teachers' understanding of ICT and MOOCs as a new pedagogical platform. Along with this line, Kabat's work (2014) points to the importance of temporality to better understand the navigation between the extended spaces in teaching and learning. With most of the data archived and easily accessible from the platform at any time and at any place, instructors could help individual students analyze and manage their temporal and spatial behaviors on the online platform. The virtual nature of the e-learning environment allows for a higher degree of individual variance in spatiality and temporality. For example, a student can decide, under the course requirements, when (e.g., the time of the day, the day of the week), where and for how long s/he will log on and work in the online platform each time. The increased opportunities for awareness and choice can help students take ownership and experience independence, growth and maturity in their own learning processes. Moving forward, the design decisions should pay closer attention to the *interconnectedness* of space and time and its impact on online learning.

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Chapter 9
The Pedagogy–Andragogy–Heutagogy Continuum and Technology-Supported Personal Learning Environments

Lisa Marie Blaschke

Keywords Andragogy · Heutagogy · Lifelong learning · PAH continuum · Pedagogy · Personal learning environments · Self-determined learning · Social media

Introduction

More autonomous and self-motivated employees—those who can manage the complexities of the workforce in creative and innovative ways—are in high demand in today's workforce, but unfortunately, employers are finding that current graduates are lacking in the necessary skills and competencies to meet that demand (CBI/Pearson Education, 2015; Jaschik, 2015). As educators, it is essential that we prepare our students for a world where learning is continuous, as well as develop the necessary skills that support students in quickly and productively adapting to the workplace. As *online* educators, we are well positioned to address workforce needs, especially as online learning is characterized by flexibility and accessibility that is required by today's worker. We also have an opportunity to support students in using technology to develop specific skills and networks that can later be transferred to working environments for lifelong learning.

Heutagogy, or the study of self-determined learning, is a theoretical framework that can be utilized in guiding teaching and learning practices to more active and self-directed learning, where learners create their own networks of knowledge, learning, and information. This chapter describes the theory of heutagogy and the

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pedagogy–andragogy–heutagogy (PAH) continuum and how this continuum is realized in personal learning environments (PLEs) supported by technology.

Heutagogy

Heutagogy—with its roots in the Greek word for *self*—is the study of self-determined learning and applies a holistic approach to developing learner capabilities "with the learner serving as the major agent in their own learning, which occurs, as a result of personal experience" (Hase & Kenyon, 2007, p. 112). Learner agency is central to the theory, as are the principles of self-efficacy, capability, metacognition (knowing how to learn) and reflection, and nonlinear teaching and learning (Blaschke, 2012; Hase & Kenyon, 2000) as seen in Fig. 9.1.

Heutagogy is grounded in a number of earlier learner-centered theories of teaching and learning: humanism/learner agency, complexity theory, social constructivism, andragogy (self-directed learning), self-determination theory, self-regulated learning, reflection and double-loop learning, self-efficacy, capability, and transformational learning. In addition to these learner-centered theories, emerging net-centric learning theories such as connectivism, rhizomatic learning, and growth mindset also share certain elements of a heutagogical approach (Anderson, 2010).
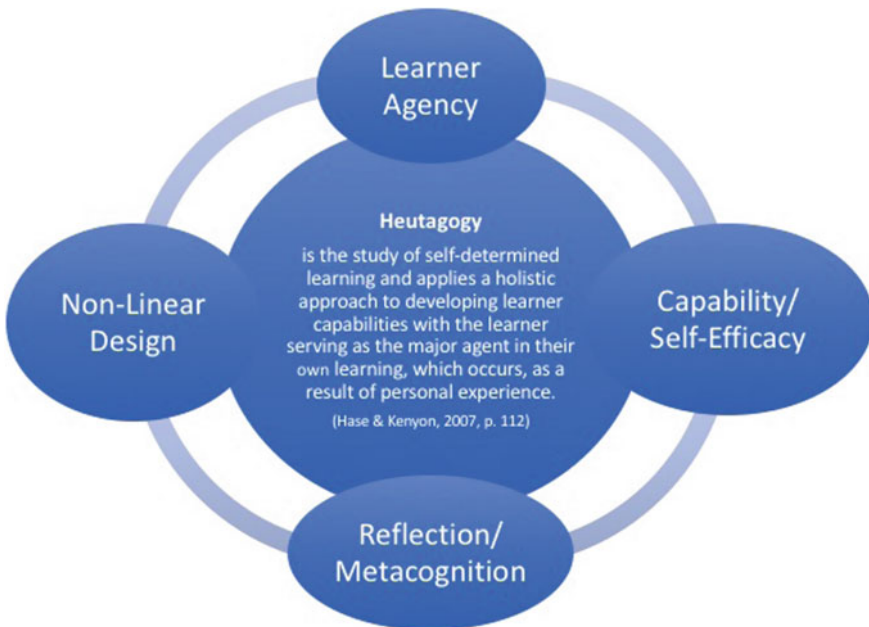

Fig. 9.1 Principles of heutagogy (created by the author)

Within a heutagogical educational environment, teaching and learning are fully learner-centered, and students have complete autonomy in defining learning goals and outcomes and deciding how achievement of those outcomes is realized (Hase & Kenyon, 2000). The instructor becomes a guide-on-the-side, providing mentoring and coaching for the student along the learning journey. As students define their learning path and make decisions about their learning, intrinsic rather than extrinsic motivation becomes the driving force in the learning process (Deci & Ryan, 2002), and as students gain more control over and responsibility for their learning, cognitive and metacognitive activity become influential factors in developing self-efficacy. With each learning success, student confidence increases and capability eventually begins to develop (Bandura, 1977). Student engagement increases as they become more deeply invested in the learning process, which can lead to deeper thinking and critical reflection on what has been learned and how (double-loop learning and metacognition), ultimately resulting in transformative learning and emancipatory thinking (Argyris & Schön, 1996; Mezirow & Associates, 1990).

When applying a heutagogical approach to teaching and learning, we place the student at the center of the learning experience, giving him/her full control over the learning path and outcomes, while building student efficacy and independence. The student is actively involved in the learning process and decides what she or he will learn and how it will be learned. Learning takes a nonlinear path, as determined by the student, and assessment of learning is a collaborative endeavor, driven by the student and agreed upon with the instructor, for example, through the use of learning contracts, learner-directed questions, flexible curriculum, and project-based learning. The design of a heutagogical learning environment includes elements of exploration, creation, reflection, connection, assessment, and sharing (Blaschke, 2016).

The instructor role in heutagogy is not diminished but rather enhanced, as she/he becomes the guide-on-the-side—the coach providing the student with resources and advice (e.g., formative assessment) as the student pursues his/her learning goals. The learning leader helps to scaffold the learning process and guides the student along a path of inquiry. In this way, heutagogy is particularly relevant within online and distance learning contexts, where the instructor role has traditionally been one of guide and mentor, and the student takes a more autonomous role than in traditional face-to-face classrooms. The role of the institution becomes that of supporting the growth and development of resources and networks for the student.

The Pedagogy–Andragogy–Heutagogy (PAH) Continuum

The heutagogical approach can be viewed as a continuum or a progression from pedagogy[1] to andragogy and then to heutagogy, with learners likewise progressing in maturity and autonomy as they move from pedagogy to heutagogy (Blaschke, 2012;

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[1]Pedagogy within this context is understood as traditional (chalk-and-talk) classroom teaching.
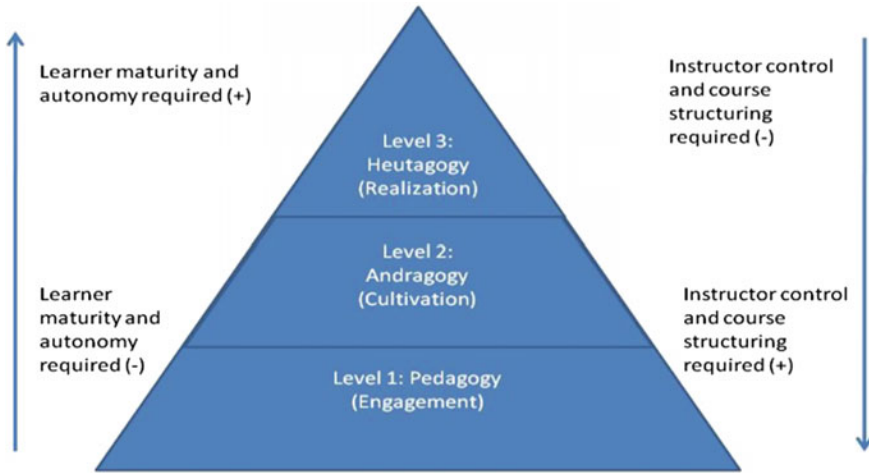
Fig. 9.2 PAH continuum (Blaschke, 2012, p. 60; Published under a Creative Commons license)

Canning, 2010).[2] As part of the PAH continuum, the learner moves from a more structured, less autonomous educational environment to an environment requiring higher autonomy with little or no structure (Luckin et al., 2010).

In Fig. 9.2, the more mature learner (Level 3: Heutagogy) requires less course structure and instructor control and can be more self-determined in his/her learning, while the less mature learner (Level 1: Pedagogy) requires more instructor guidance and course scaffolding, until s/he has acquired the requisite maturity, autonomy, and skills to advance to the next level of more self-directed learning (Canning & Callan, 2010). Cognitive development of learners, a requirement for critical reflection and discourse to occur, could also be integrated into this pyramid, with cognitive development progressing in parallel with learner maturity and autonomy (Mezirow & Associates, 1990).

Within the PAH continuum, *pedagogy* is primarily teacher-directed, with a strong focus on transfer and acquisition of knowledge. Learner-directedness is not a prevalent characteristic, with students taking on a more passive and consumptive role, and instructors serving as gurus and the primary source of knowledge. Courses are highly structured in a standardized, linear design and instructional approach.

Andragogy—an educational theory defined by Malcolm Knowles in the 1970s—originates from the belief that teaching and learning approaches for adults should be fundamentally different from those for children and that the more mature a learner becomes, the more self-directed the learner will be in his or her learning (Knowles, 1975). Andragogy is particularly relevant within the ODE context, as

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[2]There are two schools of thought among heutagogy activists. One is that learners move along a continuum from pedagogy to heutagogy. Another line of thinking—promoted by Hase and Kenyon (2000)—is that learners are self-determined at a young age, but that this approach to learning is suppressed by school systems.

Table 9.1 Heutagogy as a continuum of pedagogy and andragogy (Blaschke, 2016) (for an expanded description of the PAH continuum, see also Kanwar, Balasubramanian, and Abdurrahman (2013), Table 1: Three approaches in learning (p. 23))

Pedagogy (teacher-directed)	Andragogy (self-directed)	Heutagogy (self-determined)
Some single-loop learning	Stronger emphasis on single-loop learning	Single- and double-loop learning
Knowledge transfer and acquisition	Competency development	Capability development
Linear design of courses/curriculum and instructor-directed learning approach	Linear design of courses/curriculum with learner-directed learning approach (e.g., organizing his/her learning)	Nonlinear design and learner-determined learning approach
Instructor-directed	Instructor–learner-directed	Learner-determined
Getting students to learn (content)	Getting students to learn (content)	Getting students to understand how they learn (process)

ODE learner has traditionally been an adult with work experience and family responsibilities. Andragogy is the next step within the PAH continuum, with the learner exhibiting more maturity and autonomy and taking more control in self-organizing and independently directing learning activities. At this level, the instructor allows for increased self-directedness and provides a more flexible course structure.

Heutagogy takes andragogy a step further, further advancing students' self-directed learning through to self-determined learning and full learner agency. Once the student has reached this level within the PAH continuum, s/he is in complete control of deciding what will be learned—and how and when; the student also decides how learning will be assessed. This level requires a high level of learner maturity and autonomy.

The key differences of the three approaches are outlined in Table 9.1.

Technology-Supported Personalized Learning Environments (PLEs)

Emerging from the PAH continuum ultimately comes a learner-defined personal learning environment (PLE), one in which the learner can continue to build and develop as new educational resources become available. PLEs are not restricted to a specific software application or tool, but are rather the complete range of resources utilized by the learner for continuous learning. Atwell (2007) finds that the PLE is supportive of lifelong and informal learning, as well as different learning styles, and he offers this definition of the PLE, stating that the PLE is "comprised of all the

different tools we use in our everyday life for learning" (p. 4). Rahimi, van den Berg, and Veen (2014) take this definition further stating:

> PLESs presume and support an active role for students by placing them in the center of their learning processes, corroborating their sense of ownership of learning, and enhancing their control in education process (paraphrasing Downes, 2006 and Buchem, 2012; para. 3).

Initially, at the start of the PAH continuum, learners can be given a basic structure for establishing and creating a PLE. As the learner moves along the PAH continuum, she or he then further expands upon the PLE. When combined with social media, heutagogy not only gives students control in designing and developing individual and personalized learning environments (PLEs),[3] but also provides a framework for students to continue to expand upon and grow their learning networks throughout their lifetimes.

In considering the PAH continuum, how might a PLE appear for students moving through the continuum, that is, from pedagogy to heutagogy?

At the Pedagogy level, development of a PLE would be primarily instructor-directed and led. The student PLE would mainly focus on resources for information consumption as defined by the course instructor, e.g., watching videos on YouTube, reading text from online links, and exploring online sources based on instructor direction. In this type of PLE, the student is establishing initial skill and competency in using online tools, with the instructor closely directing learning activities.

At the Andragogy level, the student would take more initiative in designing his/her PLE, e.g., choosing a platform for an online presence such as an e-portfolio or web site. Choice is the operative word at this level of PLE, where the student is offered more opportunity for making decisions along the learning path, although the path continues to be monitored and assessed by the instructor.

At the Heutagogy level, the student has full learner agency in developing his/her PLE. By exploiting the affordances of social media—knowledge creation, collaboration, reflection, connection, and networking—the student is able to further extend his/her classroom environment to a broader local and global community (Blaschke, 2014; McLoughlin & Lee, 2007). Using the tools available, the student further builds upon his/her PLE, one that can then transition with the student from the academic environment to the workplace. Here are a few examples of heutagogy in action using social media[4]:

- Becoming curators of content using online curation tools such as ScoopIt! and Diigo.
- Creating a blog spot to document the learning journey and for reflecting on the learning path and experience.
- Establishing an online e-portfolio to demonstrate competencies and skills and to showcase accomplishments.

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[3]For more on personal learning environments (PLEs), see Atwell (2007) and Rahimi, van den Berg, and Veen (2014).

[4]For additional examples of heutagogy in action, see Blaschke, Kenyon, and Hase (2014).

- Designing and developing YouTube videos in relation to a research topic and/or as a reflective activity.
- Connecting with and following experts and researchers within the field of interest using social media networks such as Twitter, Research Gate, and LinkedIn.
- Joining other practitioners in discussing and resolving research issues using the social web to create online communities of practice.
- Sharing resources and discoveries to the learning group using WhatsApp, Instagram, and SnapChat.

The foundational basis of the PLE can be any platform that the student chooses, for example, an online portfolio, a personal website, or even an app. The massive open online course, or MOOC, is a particularly interesting platform for self-determined learning and can be used by students for expanding their PLEs and professional networks. Research by Anders (2015) indicates that heutagogy aligns well with the connectivist MOOC (cMOOC), due to its characteristics of highly autonomous, self-determined, distributed and networked-based learning approach, and preliminary research by Agonács and Matos (2017) also suggest that heutagogical principles could be used a framework for scaffolding and developing self-directed and self-determined learning skills, thus increasing learner success rates in MOOCs.

Conclusion

Heutagogy is an approach that bears strong consideration for meeting today's industry requirements, as its learner-centered approach to education can support development of self-determined and lifelong learning skills in students and the kind of skills in demand in today's work environments. Pockets of policy change in favor of heutagogy are spreading—as indicated by the recommendation to include heutagogy in South Africa's national qualifications framework (Kanwar, Balasubramanian, & Umar, 2013) and the call by Malaysia's Higher Education Minister Idris to adopt heutagogical practice in higher education classrooms (Sani, 2017). That said, there are challenges in adopting a heutagogical approach in teaching and learning.

Students must be willing to step out of their comfort zones and make decisions about their learning; a heutagogical approach can be a daunting and formidable task, requiring careful yet firm instructor guidance. However, upon using a heutagogical approach students often find it difficult to return to more formal and passive pedagogies (e.g., classroom lectures). Instructors may find that a heutagogical approach shifts their role from center stage to the sidelines and results in a loss of control of the learner and his/her learning path, thus moving the instructor out of his/her comfort zone as a teacher. In addition, assessment can be a thorny issue with a heutagogical approach, as students are not always skilled enough to assess their own learning, and instructors and/or the institution may not allow for student self-assessment of learning. Research questions that invite further exploration include: Can technology-supported PLEs be used as foundational frameworks for lifelong learning (e.g., cre-

ated and developed along a PAH continuum across which the student transitions)? What institutional strategies can be utilized in the holistic application of a heutagogical approach on all levels of the institution (micro, meso, macro)? How can we measure the development of learner agency and capability resulting from the use of heutagogy in the classroom (e.g., online portfolios and learning journals) and other educational platforms such as MOOCs?

Despite the various challenges, there are benefits to adopting the approach in education. Past research has shown that a heutagogical approach can improve critical thinking and reflection, increase learner engagement and motivation, give learners more control over learning, improve the ability of learners to investigate and question ideas—and apply knowledge in practical situations, support development of independent ideas, self-confidence, develop learner capability and their ability to adapt to new environments, promote democracy of learning and social justice, and better prepare learners for workforce complexity (Blaschke, Hase, & Kenyon, 2014; Canning & Callan, 2010). Taking these benefits into account, it is evident that applying heutagogy in the classroom has the potential to not only better prepare students to become lifelong learners, but also to equip them with skills needed for the workforce.

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Chapter 10
Instructional Design Theory

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Keywords Educational technology · Instructional design · Learning · Learning space · Teaching

Background

It is important to acknowledge that instructional design (ID) is an integral component in the field of educational technology, which has also been applied in the field of open and distance education (ODE). Although several attempts have been made to define the field and derive a standard set of meanings for various terms (AECT, 1977; Ely, 1973, 1983; Januszewski & Molenda, 2008; Seels & Richey, 1994), the results have not been widely adopted or consistently used in the literature. Relative to ID, Seels and Richey (1994) use the term 'instructional systems design' (ISD) instead of instructional design and define it as 'an organized procedure that includes the steps of analysing, designing, developing, implementing, and evaluating instruction' (p. 31). The Seels and Richey definition is similar to how an AECT (1977) committee chaired by Kenneth Silber defined instructional development almost two decades earlier as:

> A systematic approach to the design, production, evaluation, and utilization of complete systems of instruction, including all appropriate components and a management pattern for using them; instructional development is larger than instructional product development, which is concerned with only isolated products, and is larger than instructional design, which is only one phase of instructional development. (p. 172).

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Some educational researchers and educational technologists also use the terms instructional development and instructional design interchangeably and consider instructional development and instructional design as being synonymous, but a complete discussion on this debate is beyond the scope of this topic and defers a complete discussion about possible differences and other nuances of each term to another forum. However, it is appropriate to mention that 'instructional design (ID) is a systematic process which is employed to develop education and training programs in a consistent and reliable fashion' (Gustafson & Branch, 2007, p. 11).

Assumptions

Regardless of how ID is defined, there is sufficient room within the fundamental concept of ID to incorporate multiple theories and philosophies of learning as well as the many advances in the technology that have become available for the design, development and delivery of instruction. However, there are three assumptions that should be revealed regarding the interpretation of the term instruction and ID.

Assumption #1 is that instruction is interpreted as both teaching and learning because both processes are inextricably connected. Teaching is an attempt to organize external events and learning is a personal and covert cognitive activity, which is idiosyncratic to an individual. Instructional strategies are the overt means by which knowledge, skills and procedures are constructed such as modelled by Gagné's Nine Events of Instruction (Gagné, Wagner, Golas, & Keller, 2005).

Assumption #2 is that ID is meant for spaces dedicated to intentional learning. ID should facilitate activities that are active, multifunctional, inspirational and situated approaches to intentional learning. The contention is that intentional learning involves multiple, concurrent interactions among the teacher, students, media and content, situated within a context and occurring during a defined period of time (Fig. 10.1).

Assumption #3 is that ID models work best when they are matched to a corresponding learning context. Learning is complex because knowledge acquisition is a dynamic system and an active construction of dynamic reality comprised of an interconnected web of patterns (You, 1993). Similarly, 'Instructional design is a process used to generate curriculum, courses, teaching units and single episodes of guided learning' (Branch, 1999, p. 145). The complexity of ID is encumbered in the model for which it is portrayed. Thus, ID models work best when they are matched to a corresponding learning context.
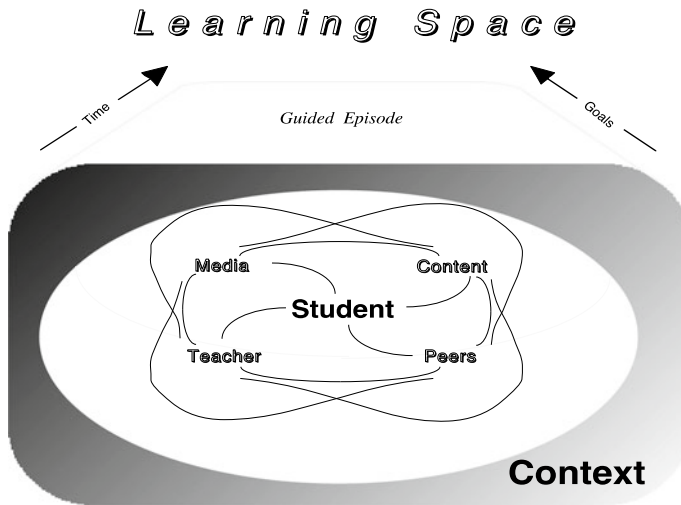
Fig. 10.1   A depiction of intentional learning space

Instructional Design Theories and Models

Educational Practice, Research and Theories

In order for learning to occur, we must see an enduring change in behaviour or performance. Changes in an individual's behaviour and performance are often the response of an intervention or stimuli. In the field of instructional design, these interventions are often attributed to new instructional strategies, exposure to new concepts, opportunities for practice and positive reinforcement. General challenges experienced by educational researchers have not changed; there is a continuous quest to identify ways to facilitate and improve learning and performance (Spector, 2008). When conducting research, an individual can examine prior work to inform their learning initiatives. As these interventions become used widespread with positive outcomes, researchers can then make connections between these experiences to formulate theories. Theories are used to explain a phenomenon and help researchers to generate new hypotheses by identifying patterns from one study to another (Hoover & Donavan, 1995). Theories often serve as bridges between research and education practice as they often inform one another simultaneously. Theories assist educators by providing explanations for interpreting data and help make predictions related to learner performance. Contextual factors that continuously influence educators and learners in situated environments aid in validating existing theories and assist researchers with developing new frameworks to explain phenomena.

Table 10.1 Required components to construct learning and instructional theories

Components of a learning theory (Driscoll, 2005, p. 9)	Components of instructional theory (Reigeluth, 1983)
The results: What are the changes in performance to be explained by the theory?	Instructional models: What blueprints have been developed to guide the instructional approach?
The means: What are the processes by which the results are brought about?	A set of conditions: How, and under what circumstances, should instructional models be used?
The inputs: What triggers the processes to occur? What are the resources or experiences that form the basis for learning?	The outcomes: What are the desired outcomes for each model under the identified conditions?

Learning and Instructional Theories

In the field of instructional design, educators rely on a number of theories to guide their design projects. While learning theories have heavily influenced the field, it is important to be able to distinguish between learning theories and instructional theories. Learning theory 'comprises a set of constructs linking observed changes in performance with what is thought to bring about those changes' (Driscoll, 2005, p. 9). Instructional design theory 'is usually thought of as a set of principles that are systematically integrated and are a means to explain and predict instructional phenomena' (Reigeluth, 1983, p. 21). The former theory is focused on the effects of the learner while the latter is focused on the effects of the instructional delivery and learning process. Table 10.1 provides an overview of the components that make up learning and instructional theories.

Descriptive and Prescriptive ID Theories

The goal of instructional design is to facilitate learning and improve performance. Instructional design is further defined as a complex process that promotes creativity during development and results in instruction that is both effective and appealing to students. The discipline is prescriptive in nature because our efforts are focused on identifying principles and procedures that yield optimal performance. Instructional design theories can be categorized as descriptive or prescriptive. Descriptive ID theories take into consideration the instructional conditions and methods used to describe instructional outcomes. Prescriptive ID theories refer to the instructional conditions and outcomes to prescribe the best methods for instruction (Landa, 1983).

ID Models

A challenge for instructional designers is determining the relationship between instructional design theories and instructional design models. Are these terms used interchangeably? How are they related? We believe that they are not synonymous, but that they do interact with one another. Instructional design models convey guiding principles for analysing, producing and revising intentional learning contexts. Most ID models visually communicate their associated processes to stakeholders by illustrating the procedures that make it possible to develop effective designs. Figure 10.2 displays the conceptual relationships among the core elements of instructional design. The five core elements, analyse, design, develop, implement and evaluate (ADDIE) inform each other as development progresses and revision continues through implementation.

The concept of ID mentioned here is characterized by at least five activities:

(1) Analysis of the contexts and the needs of the learner;
(2) Design of a set of specifications for an effective, efficient and relevant learning environment;
(3) Development of all student and course management materials;
(4) Implementation of the planned instruction; and
(5) Evaluation of the results of the design process both formatively and summatively.

The five activities above have often been referred to as ADDIE (Branch, 2009). ADDIE is actually a generic product development process that can be used anywhere there is a need to systematically produce a good or service through a cybernetic process. While a systematic approach was formally adapted by the United States Armed Services as a primary means of developing training during World War II, it has been successfully applied in education and training including open and distance education to construct performance-based learning. We contend that the true value
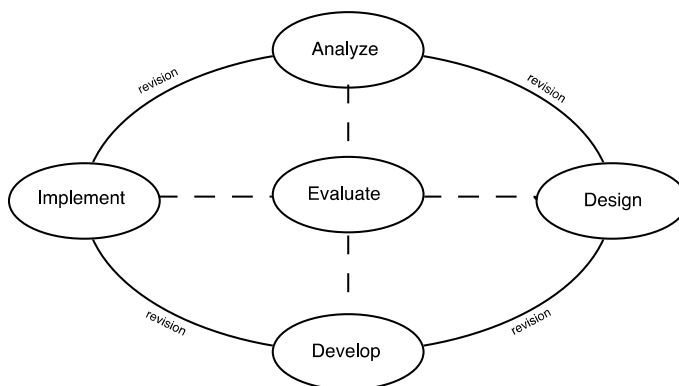

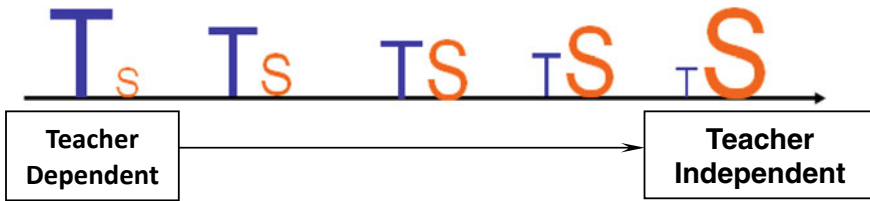**Fig. 10.2** Core conceptual elements of instructional design

Fig. 10.3 Instructional designs move students from teacher-dependence to teacher-independence

of an ADDIE approach to ID is the way it fosters strategies that move a student from being teacher-dependent to becoming teacher-independent (Fig. 10.3).

The majority of instructional design theories are prescriptive, which means that they prescribe a set of principles and methods for designing and delivering instruction. Instructional design models are a means to do that. While instructional design models are not theories themselves, they serve as frameworks to guide the instructional design based upon the tenets and the prescriptive nature of instructional design practices. Similar to an architectural blueprint, an instructional design should be able to reply on an instructional design model to provide guidance and support as they consider varying instructional conditions and desired learning outcomes while designing instructional strategies. Instructional design theories act on the premise that different learning outcomes warrant different instructional strategies (Gagné et al., 2005). For example, the selection of an appropriate instructional design model depends on whether the focus is on the classroom, a product or a process.

- Examples of a classroom focus is a set of models by Gerlach and Ely (1980) and by Smaldino, Lowther and Russell (2011), which are clearly intended for use by classroom teachers probably working alone as both the designers and deliverers of instruction.
- Examples of a product focus are a set of models by Bergman and Moore (1990) and de Hoog, de Jon and de Vries (1994). Bergman and Moore describe the way a team of instructional developers, media production staff and computer programmers, guided by a project manager and an ID model, can develop multimedia-based instructional products intended for wide distribution. Bergman and Moore's model implicitly assumes that no members of the development team will have a role in the product's implementation or use. Likewise, the model by de Hoog, de Jon and de Vries describes the process they used to develop simulations and expert system products.
- Examples of a process focus are a set of models by Dick, Carey and Carey (2005) and Smith and Ragan (1999). These systems approach models, especially the Dick and Carey model where instruction is seen as a system that consists of ten different but interconnected parts, have been widely used for designing instruction in a variety of organizational settings including large-scale ODE programmes.

Essentially, ID models derived from ID theories provide ways to develop curriculum, courses and other educational preparation materials. The basic idea is that an

ID process works best when it is matched to a corresponding context. ID is defined here as a complex process that promotes creativity during development, where the result is instruction that is both effective and appealing to students. Regardless of the learning environment (i.e. face-to-face, distance or hybrid), instructional designers must be able to provide a rationale when selecting instructional theories and models. With the continuing technological advances in the field of instruction, a debate among researchers is whether or not we need additional instructional theories and models to support the new learning environments and technological platforms.

When determining if an existing instructional model is meeting the needs of the instructional designer, it is important to consider its three components:

(1) Are there instructional design models that support the learning context?
(2) Is it clear under what conditions the instructional design models should be used?
(3) What is the purpose or designed outcome of the instructional design models?

Existing models can be evaluated for quality and suitability by taking the following into consideration: internal consistency, limitations of use, comprehensiveness, breadth of applicability, usefulness and support by empirical evidence (Reigeluth, 1983).

Conclusion

Instructional design theories promote certain themes that shape recent online learning environments. Nine of these themes that are important for the design of online learning environments are:

(1) Collaboration: Collaboration satisfies the increased need for sharing knowledge in a distance learning environment. The information sharing can be between the teacher and the student and between the student and other students. Such sharing can also accommodate pairs, small groups, large groups and even MOOCs.
(2) Connectivity: Connectivity is fostered within classes, between classes, with experts and members of the community, and even family members. This is possible due to the increasing sophistication of learning management systems.
(3) Student-centeredness: Certainly, student-centeredness occurs when students are given opportunities to discover knowledge on their own through active learning strategies. While teachers make executive decisions about the time and sequence of intentional learning activities, students are afforded more responsibility for their own learning. Thus, teachers are also facilitators of learning in addition to being possible sources of knowledge.
(4) Virtual reality: Modern instructional designs need to account for virtual learning spaces. These are spaces that may be anywhere, any place and at any time. This means that instructional designers should account for blended learning, the flipped classroom and social media platforms. We need instructional designs that can take advantage of augmented realities.

(5) Community: We want to avoid neglecting the role of community in the systematic design of instruction. We need ID theories that unite people with common interests. This means that we must improve the quality of access to teaching and learning materials.

(6) Exploration: Instructional design theories should permit exploration. Specifically, some examples of promoting exploration include problem-based learning, project-based learning, case-based learning and game-based learning.

(7) Shared knowledge: There should be ease of sharing knowledge, especially greater access to real-time data and information readily available via the Internet. There should be opportunities for both teachers and students to contribute to the knowledge base.

(8) Multisensory experiences: Instructional designs should provide multisensory experiences that feature visual, auditory, and tactile stimuli (even smell and taste), and certainly learning preferences of listening, talking and performing.

(9) Authenticity: Finally, but not least, authenticity should characterize instructional design. This means that ID should be situational, contextualized, genuine and relevant. Authenticity can be accomplished through the systematic inclusion of data from research repositories, government agencies, publisher clearinghouses, journal articles and legal proceedings.

Consideration of the above themes that shape online learning environments will inform the future research about learning and instructional strategies in open and distance education. The basic idea is that an instructional design theory works best when it is matched to a highly and positively correlated situation. However, educational contexts are often complex and feature complicated issues related to teaching and learning that are often unaccounted for during the development process. Therefore, instructional design theories need to be sensitive to different educational contexts in order to be the most productive, efficient and successful.

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Chapter 11
Media Theory

A. W. (Tony) Bates

Setting the Scene

This chapter shows how a theory of educational media can provide guidelines for instructors and course designers when using media and technology for teaching and learning purposes. However, there are limitations in applying general theories in education due to differences in teaching context, and above all, differences between students. In particular, all media can be used well or badly and good teaching requires clear objectives, clarity of instruction, and appropriate assessment of learning, no matter what medium or technology is used.

Thus, media theory in education generally, and in open and distance education (ODE) specifically, needs to be embedded within broader theories of learning. In particular, media theory must adapt to different contexts by identifying the *conditions* that facilitate or hinder the effective use of media for learning purposes.

Furthermore, an effective media theory must be able to take into account new developments in technology as new technologies may offer potentially new "affordances" or opportunities for teaching and learning. Thus, media theory in education needs to be dynamic and flexible. Finally, media theories are much influenced by cultural contexts which vary significantly from place to place.

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Despite these challenges, media theory has developed in recent years to the point where it can offer practical guidelines to teachers and course designers for technology-based learning.

History

Educational media theory has a long history. The term "lecture", which comes from the Latin "to read", is believed to originate from professors in medieval times reading from the scrolled manuscripts handwritten by monks (Manguel, 1996). The lecture has persisted to today, even though students are no longer restricted to a single source of knowledge written by hand on a scroll.

The power of writing as an educational medium has increased significantly through the development of the printing press. This has proved to be particularly important for academic knowledge, which requires codification, transparency, reproduction, and communicability, all of which is supported by text and printing.

The industrial revolution led to radically new developments in media, such as the telephone, movies, radio, and television, but these new media did not supplant the existing medium of print. We have learned that "old" media do not become obsolete and disappear but run parallel with or are incorporated into new media as their unique "affordances" are better understood.

Toward the end of the industrial period, systems theory and ADDIE (Analysis, Design, Develop, Implement, and Evaluate) became theoretical models for instructional design (Dick, Carey, & Carey, 2008). Within the ADDIE design process, there is usually a "box" which says "select appropriate media" but unfortunately no theory within the ADDIE model for making this selection.

Lastly, the digital age has brought an explosion of new media such as the Internet, search engines, social media, and adapted and virtual reality, which we are still struggling to understand and evaluate from an educational perspective. This is where sound educational media theory should be immensely helpful to teachers and course designers.

Media or Technology?

"Media" and "technology" are terms that are often used interchangeably, but it is important to be clear about the differences in any discussion of media theory. Bates (2015) sees technology as objects or tools which have no power to communicate on their own. They "just sit there until commanded to do something." Thus, computers, software, television monitors, and radio transmission towers are all technology until they become "switched on" or used by someone, at which point they become enablers of media production and delivery.

Media require the creation of content and/or communication and some reception and understanding of that communication. Media often use technology for communication, but it is only one element of a medium. In particular, media depend heavily on the use of the senses to see and hear, on symbol systems that capture meaning, such as numbers or words or images, and on the ability to interpret and find meaning in what is communicated. The use of a medium, therefore, requires a level of literacy in both creators and users of the medium.

The concept of "media" is much softer and richer than that of "technology", more open to interpretation and harder to define. But "media" is still a useful concept in education because it can include classroom teaching, allows for the use of different symbols or different ways of encoding information, and recognizes the fact that technology on its own does not lead to the transfer of meaning.

Media Theories

Media Substitution

Because media are complex and adaptable, it has proved difficult to easily identify large differences between media in educational use. This is because one medium can often be substituted by another. Teachers are ingenious and adaptable—they will use whatever tools are available. If students cannot participate in a classroom lecture, it can be recorded or streamed without loss of content or noticeably different learning outcomes.

For many years, some researchers (e.g., Clark, 1983; Russell, 1999) argued that there were no significant differences between media for educational purposes. When a large number of studies are reviewed and aggregated (a meta-analysis) the usual result is no significant difference. However, although one medium can be adequately substituted for another in many situations, there are other circumstances where one medium has an obvious advantage over another. For instance, video is usually better than text for demonstrating a process such as assembling a barbecue.

One reason researchers often find no significant differences between educational media is because there are so many variables in a teaching context that any differences due to media are swamped by other, more critical variables, such as the quality of the teaching. A well-designed lecture is more effective than a poorly designed video and vice versa. As a result, researchers such as Schramm (1977) have argued that instead of making crude comparisons between educational media, such as comparing *in general* classroom teaching with educational video, the most productive research focuses on the *conditions* in which each can best be used. As Schramm put it: "Under what circumstances and for what instructional purposes is a technology best used?".

Media Affordances

This has resulted in a search for the different educational effects or "affordances" of different media, a term first developed by the psychologist James Gibson (1979) to describe how design can "nudge" people to a certain use. In an educational context, the pedagogical affordances of a medium relate to its use for a specific teaching purpose that provides a perceived advantage over using another medium. Research over a long period of time on differences between media, involving the work of Trenaman (1967), Olson and Bruner (1974), Schramm (1977), Salomon (1979), Bates (1985), Koumi (2006), Berk (2009), and Mayer (2009), has resulted in a better understanding of the differences in media for educational purposes.

Bates (2015) argues that there are certain media that have particular importance for education. These are:

- Face-to-face human communication (e.g., classroom teaching),
- Text,
- Images/graphics,
- Audio,
- Video,
- Computing (including animation, simulations, and virtual reality), and
- Social media.

Bates (2015, Chap. 7, pp. 230–256) identifies some key unique pedagogical features or affordances for each of these media. For example, he lists some of the unique presentational characteristics of text as follows:

- handling abstraction and generalization, mainly through written language;
- enabling the linear sequencing of information in a structured format;
- presenting and separating empirical evidence or data from the abstractions, conclusions or generalizations derived from the empirical evidence; and
- enabling the development of coherent, sequential argument or discussion.

On the other hand, social media enable (among other things):

- networked multimedia communication between self-organizing groups of learners;
- access to rich, multimedia content available over the Internet at any time or place (with Internet connection);
- learner-generated multimedia materials; and
- opportunities to expand learning beyond "closed" courses and institutional boundaries.

As a means of identifying unique pedagogical affordances, Bates offers the following criteria for media analysis:

Broadcast versus communication media. There is a major structural distinction between broadcast media that are primarily one-to-many and one-way, and communication media that are primarily many-to-many. Print, radio, television, video-streaming (for example, YouTube) and lectures are "broadcast" media; the telephone, videoconferencing, social media such as Twitter, and classroom seminars are

"communicative" media. These are not rigid distinctions and should be seen as a continuum rather than separate categories. An intentional intervention by teachers, course designers or media producers can "move" a medium along this continuum (for instance, questions and discussion at the end of a lecture), but only to a certain extent.

Time and space. Two characteristics or affordances of media that are very important for teaching and learning are whether the medium is live or recorded, or whether it is synchronous or asynchronous. A live event requires all participants to be present at the same time and in the same place, such as a lecture or a seminar. A synchronous medium, such as a videoconference, requires all participants to be present at the same time, but not necessarily in the same place. However, recorded media are asynchronous in that once recorded, the medium can be used at any time of the user's choice. Books, audiocassettes, and video recordings are asynchronous technologies.

Overall, there are major advantages from a learner's perspective in recorded and asynchronous media because they offer "any time, any place" forms of learning and because the learner has more control of their learning environment (Durbridge, 1983; Grundin, 1981; Means, Toyama, Murphy, Bakia, & Jones, 2010). The ability to access media asynchronously through recorded and streamed materials is one of the most significant developments in the history of teaching, but the dominant paradigm in education is still the live classroom experience.

The representation of content. Olson and Bruner (1974) claim that learning involves two distinct aspects: acquiring knowledge of facts, principles, ideas, concepts, relationships, rules, and laws (content); and using or working on that knowledge to develop skills. In other words, Olson and Bruner differentiate between "knowing" and "doing".

Media differ in the way they represent knowledge because they differ in the symbols systems (text, sound, still pictures, moving images) they use to encode information (Salomon, 1979). Thus knowledge acquired through one medium is not exactly the same as knowledge acquired through another medium, although abstractly the content may appear to be the same. For instance, our concept of heat can be derived from touch, from mathematical symbols (800 °C), from words ("hot" or "random motion of particles"), from a graph or animation, or from an observance of an experiment. A large part of learning requires the mental integration of content acquired through different media and symbol systems. Research has shown that in general, learning tends to be deeper when content is acquired through a variety of media or symbol systems (Mayer, 2009).

Choosing the most appropriate medium for representing knowledge requires both an understanding of the content area and a sensitivity to media differences in representing content. For instance, the use of color is often highly advantageous in teaching chemistry but not generally relevant to presenting content in philosophy.

Content structure. Media also differ in the way they structure content. Some media structure content linearly or consecutively, such as books and radio, others structure content holistically or simultaneously, such as an image. Other media combine both linear and holistic structures (depending on design) such as a television documentary.

These are not "hard" affordances and are subject to design decisions, but instructors need to be aware of the tendencies regarding structure when using different media.

Skills development. Lastly, some media will lend themselves more easily for developing certain skills rather than others. Koumi (2015) has attempted to match the affordances of text and video to different types of learning objectives. For instance, video is useful for demonstrating procedural skills as video can demonstrate the action in context (and students can practice or repeat checking through the rewind capability of video). On the other hand, text is often essential for developing intellectual skills of analysis and critical thinking. More often than not, however, media are best used in combination because many learning tasks are complex and will benefit from the use of more than one medium.

The significance of the Internet. The Internet, in particular, is an extremely rich medium because it incorporates almost all earlier forms of media, except for direct human communication. Furthermore, the Internet can be categorized both in technological terms (the computers, cables or wireless bandwidths, the software that manages it, the search engines, etc.) and as a medium, when people use it to find information, communicate with others or do online learning. The Internet can also accommodate both broadcast media and communications media and is a very rich medium in that it can handle text, audio, video, and computing. Thus, the Internet provides enormous flexibility for educational purposes.

Media Selection

Given the importance of the topic, there is relatively little research-based literature on how to choose appropriate media or technologies for teaching. However, there are good reasons for this. Technology and media are constantly changing, media are often effectively substitutable, the topic has attracted relatively small amounts of research funding, there are competing views on what teaching methods are effective and above all the context of teaching and learning varies considerably.

Nevertheless, Koumi (2006) and Mayer (2009) have made strides in developing models of media selection. Mayer's cognitive theory of multimedia learning establishes twelve principles of multimedia design based on extensive research. Koumi (a former television and radio producer) provides guidelines on the best mix of audio and video and print/text resulting from his extensive experience of using different media.

However, most theories of media selection have focused solely on the pedagogical dimension but have ignored other critical factors, such as student access to technology, ease of use, the organizational conditions or infrastructure required and the costs of different media.

Bates (2015) drew on his own research, the work of Mayer and Koumi, and his 40 years of experience teaching with technology, to develop the SECTIONS model (Fig. 11.1), which attempts to provide practical guidelines for media selection for teaching and learning.
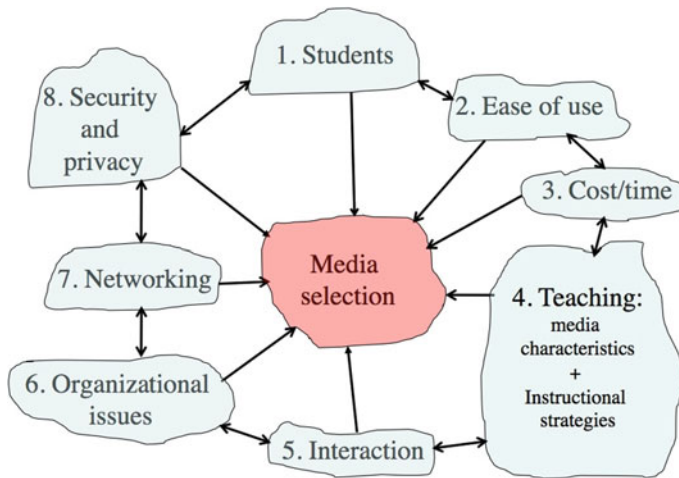
Fig. 11.1 The SECTIONS model (from Bates, 2015)

SECTIONS is an acronym standing for:

- S tudents,
- E ase of use,
- C osts,
- T eaching functions,
- I nteraction,
- O rganisational issues,
- N etworking, and
- S ecurity and privacy.

For each factor, Bates provides a set of questions to be answered by a teacher deciding on what media or technologies to use. He argues for an iterative process, considering each factor in turn then reconsidering earlier decisions in the light of later considerations. He recommends grounding the media selection process within a course design and development framework.

Challenges and Guidelines in Media Selection

There have been major challenges in researching the effectiveness of different media in education which makes the development of evidence-based theory difficult. Classic quasi-experimental research does not easily allow for the multiple variables that can affect learning effectiveness. Constantly changing technology requires a robust theoretical framework that can accommodate considerable change over time. For instance, in recent years, Downes (2007) and Siemens (2004) have advanced a new theory of

learning called connectivism, which considers developments in social media. Any model for media selection in education needs to at least address the issues raised by the theory of connectivism.

Thus, the context in which media will be used is critical for media selection. For this reason, it is better to avoid simple comparisons between media in terms of learning effectiveness and focus more on the conditions and context in which the use of a medium is likely to be appropriate for educational purposes.

In turn, this requires a good deal of flexibility in any theory and a high level of sophistication for the educators who choose media. It is only in the last decade or so that courses or programs have begun to appear in teacher training that includes the use of modern media theory.

Nevertheless, there has been sufficient development in this field to offer the following practical guidelines to instructors in ODE:

(1) *Good teaching matters*. Clear objectives, good organization of content, clear and relevant learning activities for students, and quality assessment are required, whatever medium is used. Good teaching may overcome a poor use of technology, but technology will never save poor teaching; usually, it makes it worse.

(2) *Each medium has unique educational potential*. Intrinsic differences between media have been identified which have implications for teaching and learning; knowledge of these differences should guide media selection.

(3) *Each medium has its own aesthetic*. Each medium has a range of design and production skills necessary to exploit its unique features. Merely moving teaching from one medium (usually face-to-face) to another without adapting it to the new medium will not improve the teaching.

(4) *Educational media are flexible*. What can be achieved through one medium can often be achieved through another, but it may take more effort. Thus, the nonavailability of a particular medium does not mean that teaching cannot be effective if another medium is available instead.

(5) *The Internet is a super-technology*. Because the Internet can easily accommodate all the main educational media except face-to-face teaching, it is a particularly powerful technology for education.

(6) *Multiple media are usually more powerful in teaching than a single medium*. This is because of differences in learner preferences and ability. Different media offer different ways of understanding the same concept and tend to lead to deeper understanding.

(7) *Student numbers are critical for media selection*. Some media (broadcast media in particular) scale much more easily than other media. Media selection should be dependent on the ratio of students to instructor.

(8) *New technologies are not necessarily better than old ones*. There is no rule that says a new technology will be better for teaching than an older one. Judgement about the selection of media and technology should be made on educational and operational grounds, not by a date. In particular, many of the lessons

learned from previous technologies and media are likely to apply to the new technology.

(9) *Teachers need training to use media effectively.* The choice of appropriate media is now a core competency for all teachers, but this also requires a deep understanding of how people learn and of instructional design as well as media differences.

(10) *Teamwork is essential for effective media selection in education.* Nobody can know everything there is to know about the use of media. Subject experts, media specialists, and instructional designers will make better media selection decisions working together than on their own.

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Chapter 12
Theories of Motivation in Open and Distance Education

Maggie Hartnett

Introduction

The motivation of learners is an increasing source of interest for researchers and educators across a wide range of educational contexts including ODE. The reasons for this interest is that motivation, learning and academic success are fundamentally interconnected (Wentzel & Brophy, 2014). Motivation involves learners' values, thoughts, behaviour and emotions and has been labelled as the 'engine' of learning (Paris & Turner, 1994) because learning does not occur without it.

The lack of motivation is a significant contributor to the low retention rates seen in ODE courses (Lee, Pate, & Cozart, 2015). Conversely, high-quality motivation is linked to retention (Levy, 2007). Furthermore, motivation is associated with online participation (Hartnett, 2016), learner satisfaction (Artino, 2008), and perceptions of learning (Kickul & Kickul, 2006).

Researchers generally agree that motivation involves some kind of stimulus that directs an individual's concentration and actions to achieve particular goals (Schunk, Meece, & Pintrich, 2014). More specifically, motivation is defined as 'a theoretical construct used to explain the initiation, direction, intensity, persistence, and quality of behavior, especially goal-directed behavior' (Wentzel & Brophy, 2014, p. 2). Motivation cannot be measured directly as it is a theoretical concept that focuses on specific processes as opposed to outcomes. As a result, indirect motivation mea-

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sures are common, including behavioural indicators such as learners' choices, effort, persistence, academic achievement and self-reports. Furthermore, the quality and quantity of a leaner's motivation relate to their engagement with and enjoyment of learning, willingness to adopt new challenges, approaches to learning and creativity (Schunk et al., 2014).

Learner autonomy and learner control are central concepts in the ODE literature and are discussed in Chaps. 1 and 7 of this book. Human autonomy or agency, which refers to the proactive engagement and empowerment of individuals in their own success and development (Bandura, 1989; Ryan & Deci, 2000) is also a central concept within several motivation theories including self-efficacy and self-determination theory.

Motivation Theories

Moos and Marroquin (2010) argue that robust theories of motivation need to guide research investigating motivation to learn in ODE. With this in mind, it is important to realize that no single theoretical framework exists that fully explains all motivational processes and influences. Instead, a variety of motivational concepts and theoretical frameworks have been developed over time to explain various aspects of motivation (Schunk et al., 2014). While motivational theories encompass different ideas, there are clear interconnections between them. Brophy proposed a useful over-arching model of motivation that incorporates both expectancy and value aspects of motivation theories (Wentzel & Brophy, 2014). Theories that seek to understand learners' beliefs and judgements about their capabilities to perform within a learning context address the expectancy aspects of motivation (Bandura, 1997). Learners' beliefs associated with the reasons why they want to undertake certain learning activities and the importance they attribute to them are associated with the value components of motivation (Wentzel & Brophy, 2014).

The next section presents motivation theories with human agency as a central focus. They include self-efficacy, self-determination and interest theories. However, they are not the only theories or frameworks used in motivational research in ODE. Other theories such as causal attribution theory, which explains the reasons learners give for success and failure, and goal orientation theory which focuses on learners' achievement-related behaviours, have also been used to investigate motivation in ODE environments (Hartnett, 2016). Furthermore, Keller's (2010) ARCS model (Attention, Relevance, Confidence and Satisfaction) is a popular framework that seeks to support learner motivation by adopting a systematic learning design approach. Still, other research studies have applied different combinations of various motivation theories to identify relationships between learner motivation and success in ODE (e.g. Yukselturk & Bulut, 2007).

Self-efficacy Theory

Self-efficacy theory addresses the expectancy aspect of motivation. Originally developed by Albert Bandura, self-efficacy is a key component of social cognitive theory (Bandura, 1989). Bandura is a well-known psychologist whose research has made extensive contributions to the fields of education and psychology and was also influential in the transition from behaviourism to cognitive psychology. Human agency sits at the heart of social cognitive theory where people are proactively engaged in their own success and development. The theory is comprised of a three-way reciprocal system of cognition (perceived ability to perform a task), environment (the setting or context) and behaviour (the task being performed).

Self-efficacy is defined as 'beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments' (Bandura, 1997, p. 3). Self-efficacy is a theoretical concept that is complex, multi-faceted and context specific. It refers to an individual's future-focused judgement of competence in a given context rather than their actual level of capability. Self-efficacy relates to performance capabilities not personal characteristics (e.g. self-esteem, self-worth), and mastery measures (i.e. success or failure) are used to determine how efficacious an individual feels in a given situation (Bandura, 1997). Highly efficacious learners feel empowered to exert control over their learning and this affects how they approach their studies (Bandura, 1997). Figure 12.1 identifies the four key sources of information that inform self-efficacy judgements as well as outcomes of high self-efficacy (Bandura, 1997).

Self-determination Theory

Self-determination theory (SDT) is commonly used in education to examine value aspects of motivation employing concepts of intrinsic and extrinsic motivation. Richard Ryan and Edward Deci are distinguished psychologists who developed SDT
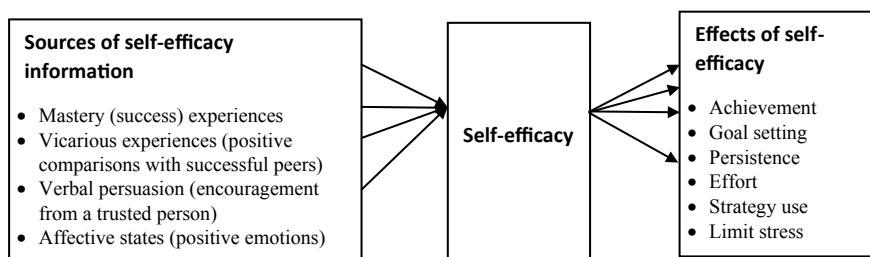

Fig. 12.1 Sources and effects of self-efficacy (Created with reference to Zimmerman (2000))

in 1985. Their theory has been applied to a wide range of life domains including education, health care, work, sport and virtual worlds.

Extrinsic motivation is 'a construct that pertains whenever an activity is done in order to attain some separable outcome' (Ryan & Deci, 2000, p. 60). Examples of separate outcomes include grades, prizes, feedback, approval and future career goals. In contrast, 'Intrinsic motivation is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequence' (Ryan & Deci, 2000, p. 56) and is similar to the concept of intrinsic value (Ryan & Deci, 2017). An intrinsically motivated individual chooses to engage in learning for the enjoyment, interest and/or challenge it provides as opposed to external factors. Intrinsically motivated individuals more readily engage with difficult tasks, adopt deep approaches to learning, enjoy learning, and are successful (Schunk et al., 2014).

Originally, intrinsic motivation was considered the only type of motivation that was self-determined or autonomous and extrinsic motivation as externally controlled. However, SDT provides a more refined interpretation. A significant part of SDT is the taxonomy of human motivation (Ryan & Deci, 2000) which characterizes motivation as a continuum of varying degrees of autonomous regulation (see Fig. 12.2). When learners feel autonomous they experience a sense of freedom and choice over their actions which align with their goals (Ryan & Deci, 2017). The continuum of regulation incorporates amotivation (lack of motivation) at one end to intrinsic motivation at the other, with different types of extrinsic motivation between the extremes. More self-determined types of extrinsic motivation incorporate concepts such as attainment value, utility value and usefulness (Ryan & Deci, 2000). Attainment value is associated with the relative importance a learner places on achieving success to support their

Regulatory styles	Amotivation	Extrinsic Motivation				Intrinsic Motivation
Type of Regulation	Non-Regulation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation
Associated processes	Perceived non-contingency Low perceived competence Non-relevance Non intentionality	Salience of extrinsic rewards or punishment Compliance/ Reactance	Ego involvement Focus on approval from self or others	Conscious valuing of activity Self-endorsement of goals	Hierarchical synthesis of goals Congruence	Interest/ Enjoyment Inherent satisfaction
Perceived locus of causality	Impersonal	External	Somewhat External	Somewhat Internal	Internal	Internal

Fig. 12.2 A taxonomy of human motivation (adapted from Contemporary Educational Psychology, 25/1, R. M. Ryan & E. L. Deci, Intrinsic and extrinsic motivations: Classic definitions and new directions, p. 61, Copyright (2000), with permission from Elsevier)

sense of self. Utility value refers to how personally relevant or meaningful learning is to an individual and how it contributes toward larger goals such as a future career.

Interest Theory

Suzanne Hidi and K. Ann Renninger are influential educational psychologists whose research has focused on the power of interest to motivate and engage learners. Similar to self-determination theory, interest theory also addresses value aspects of motivation and has direct connections with intrinsic motivation, an autonomous type of motivation. Interest is defined as a psychological state that 'involves focused attention, increased cognitive functioning, persistence, and affective involvement' (Hidi, 2000, p. 311). Two distinct types of interest have been identified which are individual and situated interest (Hidi & Renninger, 2006). Individual (or personal) interest is typically viewed as a comparatively stable trait or orientation toward particular topics. This is distinct from situational interest, which is less enduring and originates from factors within the environment. The importance of individual interest for motivation (i.e. intrinsic motivation) and learning is well-known (Hidi & Renninger, 2006). However, research also indicates that the development of situational interest has value in encouraging learner engagement and motivation for certain tasks (Hidi & Harackiewicz, 2000).

Application of Motivation Theories in ODE

While the development of self-efficacy, self-determination and interest motivational theories originated in face-to-face contexts, there is a growing body of evidence of their application in ODE. Self-efficacy is a known predictor of student satisfaction and performance in ODE contexts (Artino, 2008; Kuo, Walker, Belland, & Schroder, 2013). For example, in comparison to less efficacious learners, students who feel more efficacious in ODE environments adopt challenging goals, use metacognitive learning approaches, think critically and exhibit greater persistence (Moos & Azevedo, 2009). Prior successful ODE experiences also support perceptions of efficacy about future courses (Shen, Cho, Tsai, & Marra, 2013). As self-efficacy is a task-specific concept, recent research has demonstrated that other types of self-efficacy are also important to the success of learners in ODE contexts. They include self-efficacy to use learning management systems, self-efficacy to interact with the instructor, and self-efficacy to interact with peers for academic and social purposes (Shen et al., 2013).

A growing body of research has also explored learners' motivation for engaging in ODE courses from an intrinsic–extrinsic perspective (de Wal, den Brok, Hooijer, Martens, & Van den Beemt, 2014; Hartnett, 2016). Earlier research explored the motivational profiles of ODE learners compared with those of more traditional on-campus students (Wighting, Liu, & Rovai, 2008). Results indicated that ODE learners

were more intrinsically motivated (at the undergraduate and postgraduate level) than their on-campus peers. However, some argue that ODE students are required to be more intrinsically motivated because the learning context expects it (Martens, Gulikers, & Bastiaens, 2004).

Empirical studies, underpinned by self-determination theory, have demonstrated that a variety of factors support both learners' intrinsic and autonomous types of motivation such as the relevance of tasks to learners, the challenge presented by learning activities, personal and situational interest engendered by learning tasks, the quality and timeliness of feedback, the choices available and the provision of rationales (Hartnett, 2016; Vanslambrouek, Zhu, Lombaerts, Philipsen, & Tondeur, 2018). Other research has demonstrated that self-determination theory is an appropriate conceptual framework for the investigation of newer digital technologies. For example, learners perceive digital badges as autonomy supportive when badges are awarded based on performance (Abramovich, Schunn, & Higashi, 2013).

Research focused on ODE students' experiences of interest during learning is another importance source of empirical evidence. Personal interest is recognized as important for learning and motivation (Hidi & Renninger, 2006). Offering meaningful choices (i.e. not just lists of options) enables ODE learners to align their individual interests with learning activities (Hartnett, 2016). Personal interest is also enhanced in ODE courses that support learner autonomy (Moos & Marroquin, 2010) and where learners have a personal interest in technology (Sansone, Fraughton, Zachary, Butner, & Heiner, 2011). Massive open online courses (MOOCs) research suggests that learners enrol in MOOCs to pursue personal interests (Kizilcec & Schneider, 2015). Learners who complete a MOOC tend to be more interested in the content while non-completers are interested in the distinctiveness of the MOOC as a learning experience (Wang & Baker, 2015).

Situational interest (i.e. interest engendered by influences within the environment) also plays an important role in supporting the motivation of learners even though it can be less enduring (Hidi & Harackiewicz, 2000). Conceptual scaffolding in ODE courses can increase situational interest (Moos & Azevedo, 2008). Two distinct types of situational interest exist. Situational interest that is shorter-lived is referred to as 'triggered' while the more enduring type is referred to as 'maintained' (Hidi & Renninger, 2006, p. 111). Novel tasks or situations, such as those that occur in technology-rich settings, promote triggered situational interest. A note of caution is needed as triggered interest is known to decrease as the novelty effect drops with time (Moos & Marroquin, 2010). Maintained situational interest focuses attention for a longer period. Authentic learning methods (e.g. scenario-based learning, problem-based learning), collaborative opportunities and discussions focused on controversial topics can support the development of maintained situational interest (Hartnett, 2016).

Guidelines for Future Research

This chapter has highlighted the influential nature of both personal characteristics of learners *as well as* contextual factors on motivation in ODE. Acknowledging the complexity and dynamic interplay of factors underlying and influencing motivation to learn aligns with contemporary motivational theory.

Just as a 'one size fits all' approach to ODE does not suit all learners nor does it support all learners' motivation, future research needs to consider the complex, dynamic interconnections between learners different socialization histories, perceptions of competence and experiences. Future studies should also take into account considerations of context such as curriculum, course structure, teaching practices, assessment, peers and digital technologies used. In particular, future directions for research include:

- The process of motivation transformations (in terms of quality and complexity) over time in digital environments;
- The influence of various social factors (e.g. culture, community, family, economic) on motivation in ODE;
- Group (as opposed to individual) motivational processes in ODE contexts; and
- The effect of new digital technologies (e.g. virtual reality, augmented reality and artificial intelligence) on learner agency and motivation.

Ongoing research is critical for the development of understanding of motivation in increasingly complex digital learning environments.

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Chapter 13
Conclusion: Linking Theory, Research and Practice in Open and Distance Education

Insung Jung

Keywords Confucianism · ODE research · ODE theory · Sustainable Development Goals

Introduction

At the United Nations General Assembly in 2015, the 193 member states adopted the 17 Sustainable Development Goals (SDGs) and their targets to be achieved by 2030. Related to education, SDG4 is set to 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' by 2030. To achieve this goal, each nation would need to first identify current and future challenges in education and address those challenges by devising a wide range of appropriate national and international-level efforts and systems. Several reports (e.g. Tikly & Barrett, 2013; UNESCO, 2017) identified that in developing countries, challenges such as a lack of literacy and basic education, gender inequality in education at all levels, a lack of access to higher education, poor quality and lack of relevance in higher education, and insufficient social and technological infrastructure are common, and in developed countries, urgent challenges include a lack of access to affordable higher education and a lack of continuous professional and vocational development and lifelong learning opportunities. Clearly, ODE has great potential in meeting some of these challenges in both developing and developed countries and leading to the achievement of SDG4.

As Traxler (2018) points out, the global environments appear supportive for ODE. First, digital technologies have become smaller, better and cheaper and both wired

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and wireless networks faster, more stable and more widely available. Second, due to economic and political situations, funding for traditional education has been reduced in many countries and education itself has been seriously disrupted in several places which are experiencing conflict. And yet, demand for education, especially higher education, has increased in most parts of the world and this increased demand could not be met by conventional education modes. Globalisation and cross-border education have also promoted diversity in learners in terms of their academic, sociocultural and economic backgrounds. Learners are not necessarily looking for diplomas or degrees; many of them are becoming lifelong learners as they tend to study for their own interests or future careers.

In these changing environments, we are already observing the emergence of several types of ODE which we have not seen before. MOOCs, OER-based courses and universities, and mini or nano online degree programmes are some of the recently developed types of ODE and examples of how these and other types will change further in the future. ODE is no longer a marginalised mode or backdoor education; it is now considered mainstream in most parts of the world and indispensable for inclusive and equitable quality education when we have entered a lifelong learning society.

Despite all these changes, something remains true and important about ODE. Harasim (2016) argues that the importance of pedagogical and technological design to promote active and collaborative learning has not changed, and that a theory to understand and guide how people learn in online education is still critical for the design of an effective open and online learning environment. In this final chapter of the book, I would like to propose a framework which could help ODE researchers and practitioners select appropriate theories for their areas of research and development.

The Nexus Between Research and Theory in ODE

Zawacki-Richter and Anderson (2014) argue that 'Research questions should be posed within a theoretical framework' (p.1). The theories examined in this book may provide a theoretical framework for various types of ODE research and help researchers ask meaningful research questions and also support practitioners to explore useful solutions.

For the purpose of this section, Zawacki-Richter (2009)'s three levels of ODE research are adopted: macro-, meso- and micro-levels that are developed based on an extensive review of literature, analyses of ODE research papers and an international Delphi study (pp. 2–4).

- Macro-level research focuses on such areas as access and equity, globalisation, ODE systems and theories and cross-cultural aspects. It also looks into learning outcomes, long-term impacts and failures in ODE (Latchem, 2018). Studies in this category tend to cover ODE systems at the national, regional or international level.

- Meso-level research areas include management and organisation, analysis of costs and benefits, educational technology, innovation and change, learner support, professional development and quality assurance. Studies of this type are mostly carried out at the institutional level.
- Micro-level research is the most popular in the ODE field and includes instructional design and pedagogical approaches, interaction and communication, and distance learner characteristics. This kind of study is often conducted at the course or programme level.

Theory and research are in a dialectic and transactional relationship whereby theory determines what questions to ask in research, what data to collect and what to do with it once collected, and research findings then confirm or challenge accepted theories (Brown, 1977; Fawcett & Downs, 1986). For researchers, theory is an invaluable tool to identify and solve a good research problem and contribute to theory building and improvement. Different research situations, whether they are related to individual courses, institutions or national and international environments, call for different theories. Table 13.1 suggests various theories that may be better suited to different research situations. Note that those suggested theories for each category of ODE research are limited to the theories discussed in the book and many more theories exist for different ODE research situations and goals.

Let's consider research at the macro-level. When one is attempting to do research on changes in ODE systems globally, the industrialised teaching and learning theory might be useful to examine the input-process-output of those systems and see if the theory is still valid to explain such changes. The concepts of extended space and time in an e-education environment and connectivism may be used as a theoretical framework when one is researching on overarching and underlying features of online teaching and learning environments. In these cases, the concept of openness may be best applied in research on access and equity. However, as more research is needed at the macro-level (Zawacki-Richter, Alturki, & Aldraiweesh, 2017), more macro-level theories which explain emerging ODE systems are in urgent need. Systems theory, which explains social systems from an interdisciplinary perspective (Meadows & Wright, 2008), could be useful for macro-level studies in ODE.

At the meso-level, transactional distance theory appears suitable for research on structuring ODE courses and programmes at the institutional level. Theories of extended space and time, connectivism and openness could be applied to both macro- and meso-levels. The concepts of extended space and time may be suitable for examining areas for learner support in the extended e-education environments, connectivism may be useful in analysing the roles of various educational technologies in connecting people in distributed teaching and learning environments, and the concept of openness may be employed to look at the cost-benefits of using open resources in ODE institutions. Adult learning theory and P-A-H continuum could be used in studying issues on learner support, professional development and quality assurance. In addition, various adoption theories such as the technology acceptance model, social cognitive theory, theory of reasoned action and unified theory of acceptance and use of technology might be applied in meso-level research in order to explore

Table 13.1 ODE research and development areas at three levels and related theories

Research & Development Areas	• Access, equity, and ethics • Globalization of education and cross-cultural aspects • Distance teaching systems and institutions • Theories and models • Research methods • Outcomes and impacts	• Management and organization • Costs and benefits • Educational technology • Innovation and change • Professional development and faculty support • Learner support services • Quality assurance	• Instructional or learning design • Interaction and communication in learning communities • Learner characteristics
Levels	**Macro-level:** Systems at national, regional or international level	**Meso-level:** Management, organization and technology at institutional level	**Micro-level:** Teaching and learning at course or program level
Related Theories/ **Theoretical Frameworks**			

social, cultural, organisational and personal factors affecting technology adoption and innovation in various ODE contexts.

At the micro-level, concepts of independence and guided conversation, ID theories, motivation theories, CoI framework and media theory may be especially useful in conducting research on self-directed learning, interactions, motivational strategies and their effects on learners and learning, media selection and effectiveness. Also, they are helpful in developing course- and programme-level ODE interventions. The

ODE researchers and practitioners might use adult learning theory and P-A-H continuum in their micro-level research and practice such as developing and accessing learning activities and peer feedback embedded in MOOCs.

The above-mentioned examples are just a few ways to use the theories and theoretical frameworks shared in Table 13.1 for carrying out research in different areas and at various levels. ODE researchers and practitioners can use this framework in many ways to select the most suitable theory or theories considering their unique research context and practical interest.

Top Three Considerations for Future ODE Researchers and Practitioners

I hope this book has offered useful ideas and theoretical guidelines for those who are interested in ODE research and development. In all, 11 theories—four chapters on foundational theories and concepts, four chapters on emerging theories and three chapters on theories borrowed from other fields—have been discussed and re-examined in the context of digital age. In this conclusion, I would like to summarise the key lessons learned from this book by offering the top three considerations for future ODE researchers and practitioners.

First, *ODE research and practice should be guided by relevant ODE theories.* As summarised in various reviews and meta-analysis reports (e.g. Simonson, Schlosser, & Orellana, 2011; Zawacki-Richter et al., 2017), ODE research has been actively pursued in different learning contexts and across different cultural contexts which have resulted in several consistent findings despite some limitations. Based on the extensive review of ODE research, Simonson et al. (2011, p. 139) draw some conclusions such as (1) ODE is an effective method for teaching and learning, (2) interactions and collaborative group activities with a clear purpose are important for learning, and (3) each of ODE technologies has its own pedagogical merits and demerits. However, ODE research in general has been criticised for not having a theory that guides the research design and for being mostly descriptive and exploratory (Tallent-Runnels et al., 2006). A lack of guiding theories in the design of ODE courses and materials has also been indicated as a critical weakness of ODE practice. Theory is an essential tool for the future research and development of ODE in rapidly changing teaching and learning environments. ODE theories provide meaningful descriptions and explanations about what is known from ODE research and practice, and offer directions for future research and practice in ever-changing open and distance learning environments.

Second, *new ODE theories need to be developed and existing theories should be refined to more clearly and meaningfully understand and explain changing ODE contexts, especially at the macro-level.* As seen in Table 13.1, several existing ODE theories are more applicable for micro- and meso-level research than for macro-level research. Rapid changes in ODE environments and systems globally have brought us

new ways of designing, developing, implementing and evaluating open and online learning. For example, some of the unbundled functions in traditional ODE have been bundled again in MOOCs. A content expert in a MOOC often plays the role of a media specialist in developing her/his own online course materials using a personal computer or a mobile device. Division of labour, which used to be the key principle in traditional ODE development processes, does not seem to apply in today's MOOC business. Another example can be found in OERu—a brokerage university that supports learners to study online using free OER and receive credits from partnering higher education institutions. The way this university operates is quite different from conventional ODE institutions. Another case is related to recent technological innovations such as artificial intelligence (AI) and blockchain, and emerging trends of moving away from online and going mobile. There are both a lot of hype and scepticism around these new technologies' implications for ODE (see Köse & Koç, 2014). Yet, ODE researchers and practitioners do not have theories that help them understand and explain what is going on with these technological changes and predict what changes might happen in the future.

Third, *we need to bring educational philosophies and ODE traditions from previously unexplored regions into the refinement and reinterpretation of ODE theories*. As one might already notice, most of the theories introduced in this book are mainly based on thinking and practice from the West and are not inclusive of ideas and experiences from the East. While the boundaries of East and West vary according to the cultural or geographical criteria adopted for such division, Asia is regarded as the largest part of the East and has a long history in ODE with strong government support (Belawati & Baggaley, 2010; Latchem & Jung, 2009; Panda, 2017). Even though ODE advancement in Asia, like that of other regions, owes more to the educators and policymakers than to the theorists and researchers as argued by Perraton (2010, p. 9), traditional theories such as Confucianism have been applied in educational practice and research along with many exciting and innovative developments in the long history of education in Asia.

Placing high value on education, stressing the ethics of hard work, respecting teachers and valuing examination-based selection (Kim, 2009) are some of the common Confucian traditions in most parts of the region. Recently, in an effort to reinterpret Confucianism, Kennedy (2002) argues that Confucianism focuses on cultivating the self to be knowable, independent and autonomous via the action of reflecting, enquiring and questioning (p. 433). Taking one step further, Tan (2017) highlights a tradition of a learner-centred education in Confucianism by indicating that teachers in a Confucian context should know each student's thinking, feeling and needs to customise teaching approaches, resources, learning activities and environments, and promote reflection and independent thinking in the students, rather than directly instructing them. Moreover, as an old Confucius quote reads: '*When I walk along with two others, from at least one I will be able to learn*', Confucian heritage emphasises collaborative learning and urges teachers to facilitate and support active learning engagement through peer learning. Contrary to popular belief in Confucian values in education, these recent works reveal unknown or under-stressed aspects of Confucianism and shed light on the possibilities of innovating from original

Confucian ideas of independent and autonomous learning, needs-based personalised learning and collaborative learning for further refinement of ODE theories.

Confucianism in Asia is used as just one example of unexplored ideas for ODE theories and many more ideas exist in other parts of the world. By examining educational philosophies and traditions beyond the West, we may achieve two purposes. One is to refine and elaborate existing ODE theories by identifying conceptual commonalities and gaps in understanding and explaining ODE and by clarifying both essential and supporting parts and their relationships in the theories. Another is to contextualise the ODE theories for a certain sociocultural context. As Said (as cited in Nowicka, 2015) argues, theories travel from one place to another and can be misinterpreted and misused while travelling. When an ODE theory developed in one context is applied to a different context, it may need to be reinterpreted and adapted to effectively consider the sociocultural and philosophical differences between the two contexts.

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