CJLT RCAT
Canadian Journal of Learning and Technology
La Revue canadienne de l'apprentissage et de la technologie

Volume 42(2) – Special Issue Spring/printemps 2016

Web 2.0 and Social Media Connecting Learners in Self-Paced Study: Practitioners' Perspectives

Le Web 2.0 et les médias sociaux reliant les apprenants dans l'étude à leur rythme : points de vue de praticiens

***Janice Thiessen**, Athabasca University*

Abstract

Distance learners determine the time and place for their studies—those engaged in self-paced study may also choose the rate at which they proceed through their courses. However, it is difficult to incorporate purposeful learner-learner interaction into self-paced study. A multiple-case study included three open universities with in-house design and development of self-paced undergraduate courses. Data was gathered from in-depth interviews with course developers (academics and learning/teaching specialists), self-paced course materials, and institutional documents. This article reports on the ways in which these course designers and developers are making use of Web 2.0 and network-based approaches to encourage open, social forms of learner-learner interaction in self-paced courses.

Resume

Les apprenants à distance déterminent à quel moment et à quel endroit ils étudient. Ceux qui étudient selon leur propre rythme peuvent aussi choisir la vitesse à laquelle ils progressent dans leurs cours. Il est toutefois difficile d'intégrer une interaction significative entre les apprenants dans les études adaptées au rythme de l'élève. Une étude de cas multiples a été menée auprès de trois universités ouvertes qui conçoivent et développent à l'interne des cours de premier cycle selon le rythme de l'apprenant. Des données ont été recueillies à partir d'entrevues approfondies avec les développeurs de cours (professeurs universitaires et spécialistes pédagogiques), du matériel des cours selon le rythme de l'apprenant et de documents provenant des établissements. Cet article rapporte les façons dont ces concepteurs et développeurs de cours utilisent le Web 2.0 et les approches en réseau pour favoriser des formes ouvertes et sociales d'interactions entre les apprenants dans les cours que ceux-ci suivent selon leur propre rythme.

Introduction

Enabling students to take responsibility for, and make choices about, aspects of their learning is an important affordance of distance education. Self-paced study at a distance provides learners with opportunities for increased independence and self-direction, while offering educators the potential to reach large audiences and reduce per student costs. However, in the absence of cohorts working through courses together, it is difficult to incorporate purposeful learner-learner interaction into self-paced study. This challenge exemplifies the tension inherent in what Annand (2007) referred to as the theoretical divide between independence and interaction.

This study explored how course designers and developers incorporate learner-learner interaction into self-paced undergraduate courses at a distance. Of particular interest was how connectivist pedagogy is or is not being used to open up self-paced learning designs to new opportunities for learner-learner interaction. A multiple-case study design resulted in descriptions of case-specific issues and strategies as well as a portrayal of broad cross-case assertions. This study examined the pressures that practitioners face, their responses, as well as innovations and emergent models in the field. The main focus was on the pedagogies and processes evident as self-paced institutes evolve from, or choose to retain, distance education approaches with limited opportunities for learner-learner interaction. In particular, this article reports on the ways in which Web 2.0 and network-based approaches are providing for learner-learner interaction in self-paced study.

Literature Review

Learner-Learner Interaction

In 1994, Wagner defined interaction as "reciprocal events that require at least two objects and two actions [that] mutually influence one another" (p. 8). Wagner's definition was more inclusive than earlier definitions (e.g., Daniel & Marquis, 1979) in which interaction was limited to activities involving persons. More recently, Juwah (2006) added temporal and technological aspects, and defined interaction as "dialogue or discourse or an event between two or more participants and objects that occurs synchronously and/or asynchronously mediated by response or feedback and interfaced by technology" (p. 1). However, these additional details did not serve to clarify interaction for the purposes of this study as much as add a layer of complexity, while Wagner's (1994) time-tested definition addressed the essential elements of interaction "without compromising or restricting the wide range of possible types of interaction" (Anderson, 2003, p. 130).

There have been many efforts to describe and analyze interaction in distance education. Rhode (2008) reviewed several taxonomies, including: (a) Moore's (1989) three types of interaction, namely learner-instructor, learner-content, and learner-learner; (b) categories of interaction, including academic, collaborative, and social (Jung, Choi, Lim, & Leem, 2002); (c) Hannafin's (1989) functions of interaction for confirmation, pacing, inquiry, navigation, and elaboration; and (d) Wagner's (1997) identification of possible outcomes of interaction.

Moore's (1989) three types of interaction are common parlance in distance education, and learner-learner interaction was a key concept in this study. Moore's definition (1989) in which interaction takes place between learners, "alone or in group settings, with or without the real-time presence of an instructor" (p. 4) was further developed by Anderson (2006) who included the connections among learners and learning communities, including fellow classmates, as well as "professionals, former students, supporters, family members, informal lifelong learners, mentors, and others interested in the content and in each other" (p. 151). Anderson (2006) also noted that learning communities are supported by an environment of sharing and connections created by a range of social software. Of particular interest in this study was the possibility for social software to extend learner-learner interaction to include individuals within a learner's workplace, social network, and other non-classroom contexts.

Learner-learner interaction is often associated with collaboration (Rhode, 2008), as well as, with reducing learners' sense of isolation and fostering feelings of being part of a learning community (Thurmond & Wambach, 2004). However, requiring learners to take part in collaborative activities can also reduce students' perceived levels of satisfaction with the course (Thurmond & Wambach, 2004). For distance education institutions, efforts to increase learner-learner interaction may be constrained by increased costs per student enrolment (Annand, 1999; Weller, 2004). While learner-learner interaction is generally viewed as a positive attribute for an online course (Thurmond & Wambach, 2004), in many instances this type of interaction requires that learners sacrifice some of their freedom to choose, control, and take responsibility for aspects of their learning.

Self-Paced Study

In self-paced courses, individual learners determine the rate at which they work through their course, as well as when they will complete learning activities and assignments. Knowles' (1984) model of andragogy suggests that adults' *need to know* and their reliance on *background experience* are powerful incentives and enablers for self-paced learning. Self-pacing makes it possible for students to work quickly through familiar topics or slow down to focus on new material (Paranto & Neumann, 2006). These advantages of self-paced study are often associated with a number of disadvantages, including difficulty incorporating learner-learner interaction and low rates of course completion (Anderson, Annand, & Wark, 2005). Even so, with self-paced study, it is possible to offer multiple start dates per year (e.g., monthly or continuous intake). By accommodating students' availability and individual schedules, self-paced study can increase students' access to learning.

Some studies have compared learner achievement in self-paced environments to those in group- or cohort-paced learning (Carey, Kleiman, Russell, Venable, & Louie, 2008; Ostiguy & Haffer, 2001). Carey et al. (2008) compared self-paced and cohort approaches in online professional development for algebra teachers, and found comparable positive outcomes and no significant differences between self-paced and cohort. Similarly, Ostiguy and Haffer (2001) found no significant differences in learner achievement in an introductory college-level science course whether students learned in a traditional classroom, through synchronous television broadcasts, or at their own pace online.

In their survey of 388 experienced self-paced learners, Anderson et al. (2005) found that about 95% of respondents, were interested in being able to view the contributions of others, including current students as well as those who had already completed the course. Over three-quarters of respondents were willing to interact with others, as long as they were still free to move through the course at their own pace. The respondents who were not interested in interacting or working with classmates reported they already had a strong network of support outside the class.

Some studies of self-paced learning have suggested the need to research emerging social software and network-based learning. Poellhuber, Chomienne, and Karsenti (2008) recommended future research into the potential for social software and Web conferencing to address the challenge of facilitating interaction within self-paced study. Rhode (2009) noted that learners in a self-paced professional development program rated blogging and social bookmarking as moderately important, and he called for further research into the ways in which emerging social software might contribute to interaction in self-paced courses.

Recent research has explored possibilities for using social software in self-paced courses. Anderson, Poellhuber, and McKerlich (2010) surveyed 967 self-paced learners and concluded that while half the participants were interested in collaborative activities, overall their "knowledge and expertise with various social software [was] relatively low" (Conclusions section, para 1). In addition, Poellhuber and Anderson (2011) surveyed 3,462 self-paced learners from four Canadian distance education institutions to determine their readiness for using social software for collaboration and informal learning. Many of these students were interested in peer collaboration, but those learners who used social software reported using tools such as video and photo sharing most often (Poellhuber & Anderson, 2011); these activities require minimal participation.

Self-paced study is as effective as group- and cohort-based approaches (Carey et al., 2008; Ostiguy & Haffer, 2001). Many students who choose self-paced study are interested in interacting and collaborating with others, as long as they are still able to move through the course at their own pace (Anderson et al., 2005). While research into social software and self-paced study is relatively new, it appears that learners setting their own pace are interested in blogs and social bookmarking (Rhode, 2009) and in being able to view archived work produced by other students (Anderson et al., 2005). Even so, research into the potential for social software and network-based learning to foster learner-learner interaction in self-paced study is still in its early stages.

Connectivist Pedagogy

Anderson and Dron (2011) identified epistemological assumptions of the three generations of distance education pedagogy. Cognitive-behaviourist pedagogy reflects two major theories of learning, and its focus on changes in behaviour or knowledge reflects a view of learning as individual development and teaching as transmitting content to learners. Constructivist pedagogy draws from a number of learning theories, "acknowledges the social nature of knowledge and its creation in the minds of individual learners" (Anderson & Dron, 2011, p. 84), and supports a teaching role of guiding learners to actively integrate prior knowledge and construct new knowledge.

Connectivist pedagogy, reflecting emergent theories of knowledge, departs from the tidy links between pedagogy and learning theory that are evident in cognitive-behaviourist and constructivist pedagogy. Connectivism is often associated with work by Stephen Downes and George Siemens. According to Downes (2012) "connectivism is the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks" (p. 85). Networks exhibit the properties of diversity, autonomy, openness, and connectivity; connectivist pedagogy "seeks to describe the practices that lead to such networks, both in the individual and in society" (Downes, 2012, p. 85) through learners' practice and reflection, supported by teachers' demonstration and modeling.

Siemens (2005) described networked learning as a subset of connectivism, related to connectivism's key principle of network forming, with reduced emphasis on "presenting information, and more emphasis on building the learner's ability to navigate the information" (Implications for Higher Education and Corporate Training section, para. 2). In particular, Siemens suggests that blogs, wikis, and other collaborative tools with which learners create, connect, and share knowledge can replace the sequential presentation of content and activities typical of earlier generations of pedagogy. According to Siemens, in connectivist pedagogy, teachers create a healthy knowledge ecology in which networks can thrive, enabling learners to develop connections and links themselves.

McLoughlin and Lee's (2008) *pedagogy 2.0* represents a learning-as-participation metaphor that focuses on more on learning process than on learning outcomes. The links from pedagogy 2.0 to connectivist theory and beliefs about knowledge and learning are reflected in their statement that "knowledge does not exist in individual minds but is a product of participation in cultural practices, and learning is embedded in multiple networks of distributed individuals" (McLoughlin & Lee, 2008, p. 14). The key elements of the pedagogy 2.0 paradigm are personalization, participation, and productivity. Within these, we see principles that are consistent with self-paced learning with connectivist pedagogy, including: (a) learner choice, (b) learner agency, (c) self-regulation and management, (d) connectivity, and (e) learner-generated content (McLoughlin & Lee, 2008).

Digital technologies for interaction and communication may serve to simply replicate activities already present in conventional group-based learning (Dehoney & Reeves, 1999; Laurillard, 2007; Mioduser, Nachmias, Oren, & Lahav, 1999). However, Web 2.0 tools and social media may have the potential to transform self-paced study (Anderson, 2009; Anderson et al., 2010). Connectivist pedagogy may enable learners in self-paced courses to meet others within and outside their course, form communities, and support each other in their varied learning activities without relinquishing the freedom to study at their own pace.

Methodology

This multiple-case study investigated three cases of universities with in-house design and development of self-paced courses in order to examine how connectivist pedagogy may be enabling course developers to incorporate learner-learner interaction into self-paced study. This study did not focus narrowly on a single instance of self-paced study at a distance; the context of rapidly changing pedagogy, technology, and emerging models called for a broader investigation to examine a range of approaches to learner-learner interaction in self-paced study. Three

individual cases were examined in depth. Once individual case reports were prepared, cross-case analysis built abstractions across the findings from the cases, and provided the basis for cross-case assertions (Stake, 2006).

Cases and Participants

While ethics permission does not permit naming specific locations, the three cases for this study were all public, not-for-profit universities providing self-paced study at a distance. Even so, they varied regarding numbers of courses, registrations, and staff. As well, two of the cases were single-mode distance universities and the third was dual-mode, offering courses on-site as well as at a distance. Table 1 summarizes the key aspects of the three cases in this study.

Table 1

Three Public Distance Education Universities with In-house Course Design and Development

Case A	Case B	Case C
Single-mode distance university	Dual-mode university	Single-mode distance university
North America	North America	Europe
Established in 1970	Established in 1971	Established in 1984
850 courses, most self-paced	590 distance learning courses	400 self-paced courses
1,350 faculty and staff	Nearly 2,100 faculty and staff	600 staff [a]
Over 40,000 student registrations annually	Over 11,000 distance students; 13,072 on-campus	Over 17,000 students

Note. Data taken from institutional documents and websites
[a] Data unavailable on English language site, so provided from Case C's Wikipedia page

Data were collected by way of in-depth interviews with 26 participants, from course websites and materials for 14 self-paced courses, and from institutional documents such as course design handbooks, templates, and guidelines. Qualitative thematic analysis of interview transcripts and institutional documents, and application of a learning design rubric to self-paced course materials, contributed to three single-case reports and informed the process of cross-case analysis.

There were two groups of participants in each case. The first group, learning/teaching specialists (e.g., instructional designers, educational technologists), design and develop self-paced courses in a range of academic disciplines. The second group in each case consisted of academic faculty members. At Cases A and B, academic participants were identified by learning/teaching specialists as being innovators in self-paced course design and development, as well as most likely to offer insight on the issues of learner-learner interaction in self-paced courses and the incorporation of Web 2.0 tools and social media. At Case C, I worked with my key contact to create a purposive sample of learning/teaching specialists and academics who were perceived as innovative practitioners.

Participants related their experiences with Web 2.0 tools and social media, the ways they think about incorporating and making use of such tools, and how they suppose social media and connectivist pedagogy might be beneficial in their self-paced course designs. Course websites and learning materials for self-paced courses were examined to look for evidence of connectivist pedagogy, networked learning activities, and pedagogy 2.0 features, such as personalization, participation, and productivity (McLoughlin & Lee, 2008).

Results

This section begins with a brief narrative of results, case by case. This is followed by a summary of why and how Web 2.0 and social media are being used to enable learner-learner interaction in self-paced courses—as well as why not. This article then concludes with discussion of a key cross-case assertion from the study and suggestions for future research.

Case A

At Case A, network-based technologies are being used for learner-learner interaction in self-paced courses, but within the context of predominantly cognitive-behaviourist pedagogy. When present, learner-learner interaction is usually a required and graded activity in learning management system (LMS) discussion forums. Participants are interested in experimenting with social media and aspects of pedagogy 2.0. Where social media is being used it is an add-on interaction opportunity more that an integrated part of the course design or pedagogy. Course websites in the LMS and Case A's in-house social network are the two venues where this experimentation takes place. The in-house social network is a platform on which developers can experiment, particularly with network-based, social tools and strategies outside the institution's course development processes. Several participants describe the in-house social network as a type of virtual campus, compared to the virtual classroom of the LMS. Some participants are concerned that there seems to be only weak commitment to the in-house social network, despite their experience with how it facilitates connections among learners and evidence that students support it. However, until it is built into student courses or into ways in which people work together, it will be peripheral rather than central.

At Case A there was not a strong sense that self-paced courses could be built on networks that rely on connections, and on opportunities to learners to communicate, create, and share. At Case A, connectivist pedagogy has not gained a foothold, and learner-learner interaction has yet to achieve the openness associated with what Fiedler and Pata (2010) refer to as supporting "ongoing 'conversations' with self, others, and artefacts" (p. 406). For now, the potential for connectivist pedagogy at Case A is strongest in its social network, which participants describe as important but not fully committed to by the institution.

Case B

At Case B, learner-learner interaction in self-paced courses is infrequent; when present it usually occurs as a required, graded discussion activity in the institution's LMS. When Web 2.0 and social media are used, they are typically in course websites in the LMS and mainstream blog sites. Learning/teaching specialists use social media tools for departmental workflow and productivity, but participants have yet to incorporate social media and connectivist pedagogy

into many self-paced courses. At least one participant suggests that reliance on the LMS and its structured, traditional pedagogy mitigates against the openness necessary for bringing social media into courses. Innovation such as more open and public activity typical of social media is hampered when educators are separated from the learning environments and experiences for which they are designing.

While participants may be interested in the innovative possibilities of open, networked approaches, it is worth noting that activities such as wikis support learner-content interaction at least as much as they do learner-learner interaction. While participants in this study value the opportunities for learner-learner interaction inherent in social media, their suggestions of applications and approaches often focus on purposes related to interacting with course content, such as building glossaries and databases.

Case B's public website provides evidence of social media use at an institutional level for connecting with learners for purposes of promotion and marketing. Course developers are open to the idea of including learners from outside the course in the interactions and learning experiences in their courses. However, connectivist pedagogy is scarce in the self-paced courses there. Participants report that their efforts to incorporate social media in learning are constrained by lack of institutional resources and support, as well as concerns for protecting learners' privacy.

Case C

At Case C, learner-learner interaction is present in some self-paced courses, usually as an optional, non-graded activity in one of the institution's three learning platforms. Case C's institutional portal and mainstream social networks are the main venues for Web 2.0 and social media for learner-learner interaction. On the surface, Case C seems well positioned to incorporate Web 2.0 and networked learning approaches into self-paced courses. In the past decade, the university has researched infrastructure for integrated e-learning and providing support for personal learning working environments.

While some participants express interest in using social media, it is perhaps less for the value of open and networked pedagogy, and more for its usefulness as a vehicle for promotion and student recruitment. Even so, Case C participants are exploring possibilities for networked learning, but as they do, students are forming their own Facebook groups. One faculty area is investigating use of social networking in the collaborative portal system they use as a platform for online courses, and some at Case C are interested in developing a similar social network in the main institutional LMS.

However, there is little evidence of social media use associated with self-paced courses. A few participants suggest that some academics are reluctant to experiment and explore innovative learning design—they prefer to get their course developed as quickly as possible. As well, several participants note that the presence of three learning platforms for self-paced courses is not conducive to concerted efforts to innovate, including in the use of social media for learner-learner interaction. Some Case C participants who are interested in the use of social media are focused on reaching out through existing networks such as the systems learners use already, rather than re-creating network technologies inside their courses.

Institutional research reports provided evidence of interest in and strategic planning for ways in which Case C should shape their technological infrastructure and educational services to match the emerging user-centred paradigm inherent in Web 2.0. However, in practical terms, this ideal future is yet to be realized. Despite the lack of evidence of social media and networked approaches to learning in self-paced courses, some participants see the potential for networked learning as it is demonstrated by students who appear to combine their learning, working, and social lives online.

Results across Three Cases

Over the three cases, the most common Web 2.0 and social media tools include: (a) blogs for reflection and journaling; (b) linking to experts' blogs; (c) wikis for building glossaries and lists of resources; and (d) some bookmarking activities. There is little evidence of media sharing (e.g., photos, videos). When Web 2.0 and social media tools are used within an LMS, the activity is then confined to single course instances, making it inaccessible to learners in future versions of the course. Participants in this study generally see the value of open, networked approaches to interaction and learning as fostering the development of learning communities and enabling learners to become involved in such communities. Most of these course developers see value in sharing as a learning principle. Further, some Case C participants have investigated personal learning working environments for students and educators as a useful way to incorporate connectivist pedagogy. However, in all three cases, Web 2.0 and social media are more likely to be used for marketing and student recruitment, as well as for sources of learning content than for learner-learner interaction.

There are several reasons why participants are reluctant to make greater use of Web 2.0 network-based approaches to learning. In some cases, there is a general concern that such approaches may increase chances of students' academic misconduct such as colluding on assignments. Many participants reported the need to structure, closely monitor, and moderate learner interactions. When social media venues are external to a university in public blog sites, for example, there are concerns for protecting student privacy. In some instances, participants reported a lack of institutional support and resources for using social media, as well as a perception that some faculty members are not ready for facilitating learning in social spaces, outside the virtual classroom of the LMS.

Stake (2006) advises that in a multiple-case study, cross-case analysis involves searching for patterns and emerging themes to build assertions across cases. In this study, a key assertion is related to the presence of several gaps and differences between the perspectives of learning/teaching specialists and academics. Academic participants usually referred to courses as content and topics (nouns), while learning/teaching specialists spoke of courses in terms of activities (verbs). There are also gaps evident in difficulty transferring research findings about learning design and pedagogy into mainstream course design and development.

Most of the learning/teaching specialists and some academics in this study are early adopters/visionaries; the remaining participants are early majority/pragmatists. These groups have different characteristics and needs. Geoffrey Moore (2014) described a "chasm" with visionaries seeking dramatic change while pragmatists need incremental ways to increase

productivity, want innovations to work properly, and look to referents—others who have successfully implemented innovation.

Conclusions and Further Research

Elgort (2005) applied the concept of a chasm between early adopters/visionaries and early majority/pragmatists to e-learning. Making change in education is "a *multidimensional process* located in two planes: the plane of technology and the plane of pedagogy" (Elgort, 2005, p. 184). Innovation within these two planes often follows different adoption cycles (e.g., adoption of an LMS may be in a more advanced stage compared to pedagogical innovation). Elgort (2005) suggested that for e-learning innovation, the chasm is "primarily associated with teaching and learning processes, rather than with the use of technology" (p. 184). The findings of this multiple-case study reinforce Elgort's suggestion that pedagogical innovation is a much different endeavour than, for example, course developers' adopting specific technology tools. In all three cases, pedagogical innovation lags behind adoption of technology tools. Those involved in professional and faculty development may benefit from Elgort's suggestion that pedagogical innovation is fostered when practitioners reflect on their beliefs about teaching and learning.

According to one participant in this study, many social networks sustain lively communities of interest around a range of topics from parenting, to customizing camping vans, to sharing health information and experiences. Meanwhile, educators are "pulling the strings" to try and make learning communities come alive. More research is called for in order to explore ways in which people engage in open and social approaches to sharing common human experiences, including learning in general, and self-paced learning in particular. Research is needed into the ways in which these mediated opportunities can be turned upon the problem itself, so that academics and learning/teaching specialists gain first-hand experience of learning and contributing in open, social, and networked contexts.

References

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distance Learning, 4*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/149/230

Anderson, T. (2006). Interaction in learning and teaching on the educational semantic web. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 141–155). New York, NY: Routledge.

Anderson, T. (2009). *The dance of technology and pedagogy in self-paced distance education.* Paper presented at the 17th ICDE World Congress, Maastricht. Retrieved from http://auspace.athabascau.ca:8080/dspace/bitstream/2149/2210/1/The%20Dance%20of%20technology%20and%20Pedagogy%20in%20Self%20Paced%20Instructions.docx

Anderson, T., Annand, D., & Wark, N. (2005). The search for learning community in learner paced distance education: Or, 'Having your cake and eating it, too!'. *Australasian Journal of Educational Technology, 21*(2), 222–241.

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning, 12*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890/1826

Anderson, T., Poellhuber, B., & McKerlich, R. (2010). Self-paced learners meet social software: An exploration of learners' attitudes, expectations and experience. *Online Journal of Distance Learning Administration, 13*(3). Retrieved from http://www.westga.edu/~distance/ojdla/Fall133/anderson_poellhuber_mcKerlich133.html

Annand, D. (1999). The problem of computer conferencing for distance-based universities. *Open Learning, 14*(3), 47–52.

Annand, D. (2007). Re-organizing universities for the information age. *The International Review of Research in Open and Distance Learning, 8*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/372/952

Carey, R., Kleiman, G., Russell, M., Venable, J. D., & Louie, J. (2008). Online courses for math teachers: Comparing self-paced and facilitated cohort approaches. *Journal of Technology, Learning, and Assessment, 7*(3). Retrieved from http://www.jtla.org

Daniel, J., & Marquis, C. (1979). Interaction and independence: Getting the mixture right. *Teaching at a Distance, 15*, 29–44.

Dehoney, J., & Reeves, T. (1999). Instructional and social dimensions of class web pages. *Journal of Computing in Higher Education, 10*(2), 19–41.

Downes, S. (2012). *Connectivism and connective knowledge: Essays on meaning and learning networks* (version 1.0). Retrieved from http://www.downes.ca/files/books/Connective_Knowledge-19May2012.pdf

Elgort, I. (2005, December). E-learning adoption: Bridging the chasm. In *Ascilite* (pp. 181–185). Retrieved from http://ascilite2012.org/conferences/brisbane05/blogs/proceedings/20_Elgort.pdf

Hannafin, M. J. (1989). Interaction strategies and emerging instructional technologies: Psychological perspectives. *Canadian Journal of Educational Communication, 18*(3), 167–179.

Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International, 39*(2), 153–162.

Juwah, C. (2006). Introduction. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 1–5). New York, NY: Routledge.

Knowles, M. S. (1984). *The adult learner: A neglected species* (3rd ed.). Houston, TX: Gulf.

Laurillard, D. (2007). Foreword. In H. Beetham & R. Sharpe (Eds.), *Rethinking pedagogy for a digital age* (pp. xv–xvii). New York, NY: Routledge.

McLoughlin, C., & Lee, M. J. W. (2008). The three p's of pedagogy for the networked society: Personalization, participation, and productivity. *International Journal of Teaching and Learning in Higher Education, 20*(1), 10–27.

Mioduser, D., Nachmias, R., Oren, A., & Lahav, O. (1999). *Web-based learning environments: Current states and emerging trends.* Paper presented at the Ed-Media 1999. World Conference on Educational Multimedia, Hypermedia and Telecommunications, Seattle, USA.

Moore, G. A. (2014). *Crossing the chasm: Marketing and selling high-tech products to mainstream customers* (3rd ed.). New York, NY: HarperCollins.

Moore, M. G. (1989). Three types of interaction. *American Journal of Distance Education, 3*(2), 1–6.

Ostiguy, N., & Haffer, A. (2001). Assessing differences in instructional methods: Uncovering how students learn best. *Journal of College Science Teaching, 30*(6), 370–374.

Paranto, S., & Neumann, H. (2006). Analysis of a student-centred, self-paced pedagogy style for teaching information systems courses. *Systemics, Cybernetics, and Informatics, 4*(6), 1–4.

Poellhuber, B., & Anderson, T. (2011). Distance students' readiness for social media and collaboration. *The International Review of Research in Open and Distance Learning, 12*(6), 102-125. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1018

Poellhuber, B., Chomienne, M., & Karsenti, T. (2008). The effect of peer collaboration and collaborative learning on self-efficacy and persistence in a learner-paced continuous intake model. *The Journal of Distance Education, 22*(3), 41–62.

Rhode, J. F. (2008). *Interaction equivalency in self-paced online learning environments: An exploration of learner preferences* (Doctoral dissertation, Capella University).

Rhode, J. F. (2009). Interaction equivalency in self-paced online learning environments: An exploration of learner preferences. *The International Review of Research in Open and Distance Learning, 10*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/603/1179

Siemens, G. (2005). *Connectivism: Learning as network creation*. Retrieved from http://www.elearnspace.org/Articles/networks.htm

Siemens, G. (2008). *What is the unique idea in connectivism*. Retrieved from http://www.connectivism.ca/?p=116

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: Guilford Press.

Thurmond, V. A., & Wambach, K. (2004). Understanding interactions in distance education: A review of the literature. *International Journal of Instructional Technology and Distance Learning, 1*(1), 9–26.

Wagner, E. D. (1994). In support of a functional definition of interaction. *American Journal of Distance Education, 8*(2), 6–29.

Wagner, E. D. (1997). Interactivity: From agents to outcomes. *New Directions for Teaching and Learning, 71*, 19–26.

Weller, M. (2004). Models of large-scale e-learning. *Journal of Asynchronous Learning Networks, 8*(4), 83–92.

Author

Janice Thiessen has been a distance learner and educator for over 20 years. This experience, and her research into how and why learning/teaching specialists and faculty incorporate learner-learner interaction into self-paced undergraduate study at a distance, informs her work as a course designer/editor in Athabasca University's Faculty of Business. Email: jant@athabascau.ca

 This work is licensed under a Creative Commons Attribution 3.0 License.