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Mapping research trends from 35 years of publications in *Distance Education*

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ABSTRACT

This article maps out trends in distance education research and scholarship from 35 years of publications in the *Distance Education* journal. Titles and abstracts of 515 full papers were analyzed using the text-mining tool Leximancer™ to identify and describe themes in distance education research covered by these publications in the journal over the period 1980–2014. Analysis of titles and abstracts over 5-year periods reveals the following broad emerging themes over the seven time periods: professionalization and institutional consolidation (1980–1984), instructional design and educational technology (1985–1989), quality assurance in distance education (1990–1994), student support and early stages of online learning (1995–1999), the emergence of the virtual university (2000–2004), collaborative learning and online interaction patterns (2005–2009), and interactive learning, MOOCs and OERs (2010–2014). The place of these themes within waves of alternating institutional and individual research is discussed.

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Introduction

Research in open, flexible and distance education is relatively young in relation to educational research more generally. Early rounds of this research grew out of the practice of teaching and learning in the open, flexible and distance education mode. A lot of this research in the early days was predominantly descriptive in nature and much of it often criticized for being atheoretical, unsystematic and poorly designed (e.g., Moore, 1985; Perraton, 2000; Saba, 2000).

However, starting in the 1960s remarkable progress was made in distance education research and scholarship, as Otto Peters (one of the pioneers of the theory and practice of distance education) observed in light of the historical development in which he played a leading role as researcher and administrator:

> Looking back at the unbelievable absence of any academic research in the fifties and at its modest beginning in the sixties we become keenly aware of the enormous progress which has been achieved since then in a relatively short time. (Peters, 2014, p. xii)

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Over these years, the literature of distance education has matured and improved substantially, contributing to the professionalization of the field (Simonson, Schlosser, & Orellana, 2011). And in a recently published book, Zawacki-Richter and Anderson (2014) outline steps towards a research agenda that is based on a validated framework for future research activity in the field (Zawacki-Richter, 2009; Zawacki-Richter, Bäcker, & Vogt, 2009).

Peer-reviewed journals are important channels for the dissemination of the products of this kind of research and scholarship in the field (Zawacki-Richter & Anderson, 2011). They serve as a form of 'communication system' (Garfield, 1972, p. 471) which reveals the intellectual structure of a scientific knowledge network (Liu, 2007). However, highly rated peer-reviewed journals in distance education have been around for not much longer than 30–40 years. One of the most established of these journals in the field is *Distance Education*, which is owned by the Open and Distance Learning Association of Australia and published on its behalf (both online and in print form) by the Taylor & Francis Group. This scientific journal began publishing in 1980 with a highly cited article defining distance education by one of its founding executive editors Desmond Keegan (Keegan, 1980), and thus marking the beginning of the professionalization of distance education as a scholarly field of its own (Delling, 1971).

As has been suggested by West (2011):

> There is practical value to understanding who we are right now, and who we have been in the very recent past. To understand this, it can be helpful to review some of the journals in our field to see what conversations are being held, research being conducted, tools being developed, and theories being accepted. (p. 60)

This article reports on a substantial initiative in this regard. It seeks to map out the terrain of research and scholarship in distance education from the first 35 years of publications (1980–2014) in the *Distance Education* journal. Using the text mining tool Leximancer™, it explores the key themes covered in the publications over this period and the semantic relationships among these themes, including how they have changed over this time period. For an earlier preliminary attempt along these lines for publications in this same journal see Smith (2004).

Method and sample

As has been suggested by Lee, Driscoll, and Nelson (2004), 'understanding trends and issues in terms of topics and methods is pivotal in the advancement of research on distance education' (p. 225). Content analysis enables us to do this. It examines the conceptual structure of text-based information and it can be used to identify the most important and commonly occurring themes within large bodies of text (Krippendorff, 2013). The advantage of using automated content analysis tools is the mitigation of human subjectivity that would require 'extensive investment of time and money in the [content analysis] process.' For example, code books or dictionaries must be validated, coders must be trained, and inter-coder reliability must be established (Smith & Humphreys, 2006, p. 262).

For the purposes of this study, the software tool Leximancer™ (2011) was used to produce a set of concept maps from titles and abstracts of articles published in the *Distance Education* journal over the period 1980–2014. This journal was selected for this purpose because it is the oldest and most established of all journals in the field with a high impact factor in terms of citations of its content (Zawacki-Richter & Anderson, 2011; Zawacki-Richter, Anderson, &

Tuncay, 2010). Notwithstanding its reputation and standing in the field, we are acutely aware that a peep into the contents of this one journal (as much as it is a leader of the pack) offers us but one window into the growth and development of research and scholarship in distance education over the past 35 years.

And this is not the first time Leximancer™ has been put to such use. The tool has been used by others for content analysis of other academic journals, such as the *Journal of Cross-Cultural Psychology* (Cretchley, Rooney, & Gallois, 2010), the *Journal of International Business Studies* (Liesch, Håkanson, McGaughey, Middleton, & Cretchley, 2011), and the *Journal of Communication* (Lin & Lee, 2012).

Moreover, it has been suggested that the use of computer-aided content analysis tools is an appropriate method to map out a research domain (Fisk, Cherney, Hornsey, & Smith, 2012). Software tools such as this help to identify core concepts within textual data (producing a conceptual analysis) and how these concepts are related (a relational analysis) by recording the frequency with which words co-occur in the text. Similar concepts that appear in close proximity are clustered in the visual map produced by Leximancer™ (see Smith & Humphreys, 2006). 'The map is an indicative visualization that presents concept frequency (brightness), total concept connectedness (hierarchical order of appearance), direct inter-concept relative co-occurrence frequency (ray intensity), and total (direct and indirect) inter-concept co-occurrence (proximity)' (Smith & Humphreys, 2006, p. 264). Depending on the connectedness of concepts, a thematic region is formed identifiable by the most prominent concept.

Titles and abstracts of peer-reviewed articles were used for the purposes of this analysis because they are usually lexically dense and focus on the core concepts, themes and results of research. As part of this study, abstracts and titles of 515 articles published in the *Distance Education* journal between volume 1(1) in 1980 and volume 35(3) in 2014 were collected. A total of 515 full papers and subsets of data in 5-year periods were created: 1980–1984 (56 articles), 1985–1989 (50 articles), 1990–1994 (56 articles), 1995–1999 (75 articles), 2000–2004 (75 articles), 2005–2009 (101 articles), and 2010–2014 (102 articles).

The 515 titles and abstracts were drawn from all issues of the journal. In early 2000, as the journal moved from in-house publishing to commercial publishing there was a need to increase the number of issues per volume from two to three without compromising the quality of the journal. At that time, with the number and quality of submissions for publication consideration, the best way three issues per volume could be achieved was by devoting a third issue (issue number 2) to a special theme. The themes that these special issues covered were seen in this analysis like all the articles in the general issues of the journal, as reflecting the interests and concerns of researchers, scholars and practitioners in the field at that time. The special themes were selected from submissions to a public call for expressions of interest in guest editing a special theme. These special themed issues were a way of allocating significant page space in the journal to exploring a topic in depth as opposed to publishing one or two articles on it in a general issue of the journal. They were also a way of introducing guest editors who were carefully identified to bring new perspectives and insights, and perhaps a different way of engaging with the readership, such as with commentaries and reflections on the articles published in that issue. Table 1 presents the list of special themed issues of the journal since 2005.

Table 1. Special issues in Distance Education by year.

Year	Volume	Issue	Topic
2014	35	2	MOOCs: Emerging research
2013	34	2	Education across space and time: Meeting the diverse needs of the distance learner
2012	33	2	OERs and social inclusion
2011	32	2	Distance education for empowerment and development in Africa
2010	31	2	Distance education and mobile learning
2009	30	2	Learning design
2008	29	2	Effective, efficient and engaging learning in the digital era
2007	28	2	Distance education technologies – An Asian perspective
2006	27	2	Online distance education – New ways of learning, new modes of teaching
2005	26	2	Distance education: Past contributions and possible futures

Caveat emptor

We acknowledge that the selection of the sample for the purposes of this bibliographic analysis is subject to various types of influences:

> The most important of these is surely the gatekeeping role of editors, editorial boards and reviewers of submissions to the journal. Quite aside from what one might prefer to do, publication responds to funding possibilities and publishing possibilities, and these in turn respond to connections and selection of a topic, a method, and a choice of potential journal most likely to lead to publication. (Goldenberg & Grigel, 1991, p. 436)

Furthermore, our sample is sourced from only one journal which publishes in the English language and therefore drawing the bulk of its publications from the English-speaking world.

There are advantages of using a text mining tool such as Leximancer™ for this kind of analysis as the tool has been known to produce stable results (Harwood, Gapp, & Stewart, 2015). Their analysis revealed encouraging similarities between a Leximancer™ output and main themes and codes derived from a manual grounded theory analysis. But these authors are quick to point out that:

> Leximancer is not a panacea, it still requires analytical sensitivity and judgment in its interpretation, but it is straightforward to probe the data and cross-check via the resultant maps. [...]. Leximancer™ enables the analyst to make sense of large narrative data sets with minimal manual coding. The result is an efficient and impartial second opinion on open codes (concepts, categories and dimensions) and potential links between them. (p. 1041)

The generated results are best interpreted with a deep and profound understanding and knowledge of the subject matter and the field that is under this form of investigation.

Results and discussion

Overall scope of the Distance Education *journal (1980–2014)*

An initial overall analysis was run with titles and abstracts of all 515 articles, in which common terms such as *and*, *not*, were excluded. And the tool was requested to merge word variants such as *distance* and *education* or *open* and *university*. The software tool was used to analyze both the entire data-set (1980–2014) and the data for each 5-year time period separately. Figure 1 depicts the major topics covered in the articles published over the first 35 years of the journal (1980–2014). The thematic summary includes a connectivity score to indicate the relative importance of the following themes: *education* with 1005 direct mentions within

Figure 1. Overall concept map ($N = 515$ articles published between 1980 and 2014).

the text (100% relative count), followed by *learning* (63% connectivity), *students* (53%), *research* (36%) and *interaction* (6%).

This is not a surprising result, as this journal began with a focus on open, flexible and distance learning in the higher education sector, and later on extended that focus to include other locations of educational activity such as schools, home and the workplace. A key focus of the articles over this time period is open and distance teaching institutions and educational technologies, including the development and role of technology-mediated teaching and the professional development of staff engaged in the process. And as would be expected, the dominating context of these articles is universities and the higher education sector.

The other two major topics covered in these articles (i.e., *students* and *learning*) are connected via the theme *interaction*. Learning is seen in these articles as a social process that is facilitated by interaction among participants. And the provision of opportunities for interaction, communication and collaboration between students and their teachers as well as among students via two-way media is proposed as a constituent element of distance education. In such settings learning and teaching is seen as the result of careful design and orchestration of the learning environment, communication processes, learner support and use of learning materials.

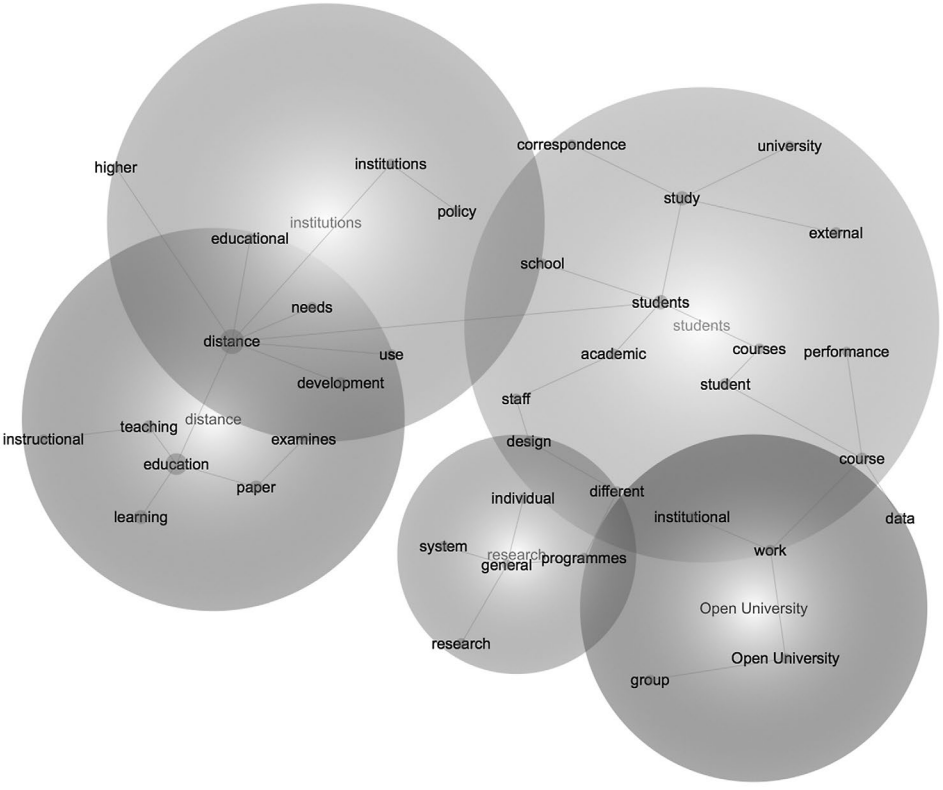

Figure 2. Concept map for the time period between 1980 and 1984 ($N = 56$ articles).

There are several recurring concepts in the seven 5-year periods, and these include *students*, *learners*, *course*, *instructional design*, and *educational technology*. They encapsulate broad and common thematic areas canvassed throughout the whole time period. In the following analysis and interpretation, emphasis is placed on new and emerging concepts in order to describe the shifting trends in distance education research over the time period.

Professionalization and institutional consolidation (1980–1984)

Topics and themes covered in the first 5 years (1980–1984) include *distance* (100%), *students* (68%), *research* (16%), *institutions* (14%) and *Open University* (9%) (see Figure 2).

At this early stage of the development of research and scholarship in the field, much of the writing is grappling with conceptions of key and defining terms such as *distance*, *students* and *open university*. The first single-mode open and distance teaching universities were established in the late 1960s and early 1970s. Most prominent among these were the Open University of the United Kingdom founded in 1969, Athabasca University in Canada in 1970, the Empire State College (USA) in 1971, Korea's National Open University (KNOU) in 1972, the Open University of Israel in 1973, and the FernUniversitaet in Hagen, Germany, in 1975 (cf. Zawacki-Richter, von Prümmer, & Stöter, 2015).

The concept *institutions* forms a thematic region of its own, linked with *policy* and with a considerable overlap with the thematic region *distance*. There is a great deal of interest

during this early period, and appropriately so, on understanding the nature, scope and functions of these organizations on a macro-level, and ways in which their operations differed from conventional educational institutions. After a decade of distance education practice, the 1980s were a time of reflection on these newly founded institutions. Many papers published between 1980 and 1984 sought to describe professional practices based on cases from various distance teaching institutions; thus, the concept *Open University* is connected with *course* and *student* via *work-institutional*. For example, there are articles published around this time that deal with course development procedures at the University of New England (Smith, 1980), student demand at the UK's Open University in the first 8 years (McIntosh, Woodley, & Morrison, 1980), factors affecting attrition and performance in distance education courses at the University of Papua New Guinea (Kember, 1981), the organizational structure of mixed-mode organizations such as Deakin University in Australia offering both on-campus and off-campus programs (Jevons, 1984), and the foundation of the Dutch Open University (Holmberg, 1983).

The early 1980s also marked the beginnings of the professionalization of distance education as a scholarly field, and articles published at this time reflect thinking along these lines. A seminal article, defining the field and the profession, was published in the first issue of the first volume by Desmond Keegan, one of the two founding editors of the journal (Keegan, 1980). This remains a widely cited article even today. Other articles debated if distance education, at this early stage of development, reflected the characteristics of an academic discipline of its own (Sparkes, 1983).

Our analysis reveals that researchers during these early stages of the growth of research and scholarship in the field were most concerned with challenges around the establishment of distance teaching universities, identity and identity formation of distance education as a unique and legitimate field of scholarship, as well as the emergence and recognition of distance educators as professionals.

Although modeling and theorizing about distance education had begun to emerge as early as the 1960s and 1970s, the first round of publications in the journal were critical of the lack of theory-based research that could handicap the development and recognition of distance education as a viable field of professional practice (Bååth, 1981), or as a discipline (see Moore & Kearsley, 2005, p. 220). There is also growing interest at this stage in writing about the challenges and problems of research in a new open university, such as the Dutch Open University. Much of the institutional research around this time is dominated by 'needs assessment type research' in order to address the need to forecast the number of students who might be looking for distance learning opportunities (Enckevort, 1984). There were growing calls for the adoption of more qualitative data-gathering strategies directed at specific target groups and specific and problematic areas of distance education such as student counseling and student support.

Instructional design and educational technology (1985–1989)

These challenges remained the focus of scholars in the field for some time yet, but the period 1985–1989 began to see a few other challenges coming to the fore and occupying the interest of researchers. These included best practices for course design in distance education and the adoption and integration of educational technologies in distance learning and teaching. The concept map for the time period 1985–1989 (see Figure 3) reveals four major

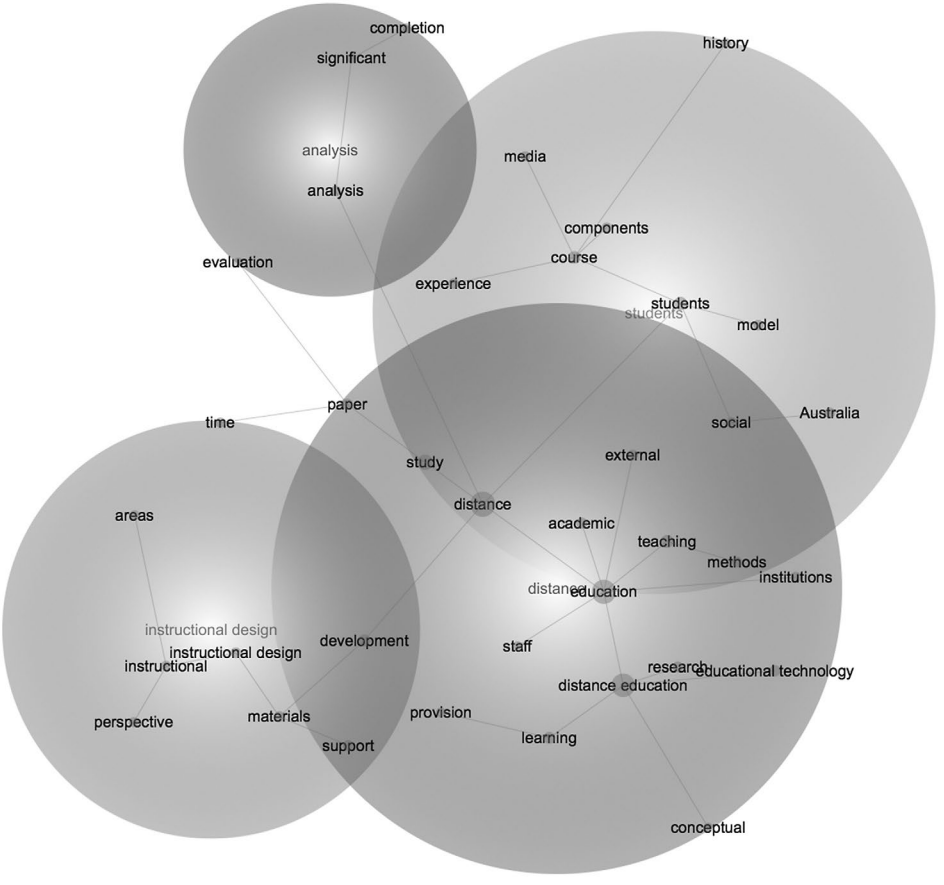

Figure 3. Concept map for the time period between 1985 and 1989 ($N = 50$ articles).

themes appearing in the article published in the journal: *distance* (100%), *students* (23%), *instructional design* (9%), and *analysis* (4%). It seems natural that after having dealt with the foundation and establishment of distance teaching institutions researchers turned their attention towards the details of teaching and learning in the distance education mode on the micro-level (cf. Zawacki-Richter, 2009).

Commonly occurring topics *students* and *distance* are directly connected with a considerable overlap. And students who choose to study at a distance are a major focus of articles appearing over this time period between 1985 and 1989. Figure 3 shows that the concept *course* is linked with *instructional design* via *students*, *distance*, *development* and *materials*. Clearly, there is increasing interest in and awareness among practitioners of the importance of appropriate learning materials to facilitate and support learning and teaching at a distance and the role of the literature on instructional design for help with the planning and development of these materials.

There is growing interest in the challenges of teaching and learning of specific content areas (*course* linked with *history*), courses, and curricula such as history (Finkel, 1985), but also foreign languages (Holmberg, 1985), and sociology (Nation, 1987). These articles deal with domain-specific limitations and challenges posed by particular learning and teaching

activities such as practical experiences in the teaching of physics (and other natural science courses) at the UK's Open University (Shott, 1985).

There is also growing awareness among scholars and practitioners at this time of the challenges posed by the separation of learners, teachers and the teaching institutions in distance education, and how perhaps various educational technologies and media can help bridge this divide. Consequently, *media* and *educational technology* emerge as new concepts in the concept map for this period. There are reports of technologies being introduced with the hope of improving quality, equity and participation in distance education but also with the intention to cut costs (Lange, 1986). This is represented in the application of 'new' educational technologies such as audio teleconferencing (Rothe, 1985), interactive telecourses (Persons & Catchpole, 1987), and electronic mail (Vivian, 1986).

Distance education demanded and needed innovative solutions to the challenges posed by the separation of the learners from their teachers and the learning organization. Many of the solutions that were emerging and being reported on at the time were spilling over and also benefiting conventional face-to-face teaching practices. A classic example of this was the self-instructional multimedia course package. Once developed for distance learners, these study materials were being adopted as part of the on-campus teaching programs. Often developed through rigorous course team processes (pioneered by distance teaching institutions such as the UK's Open University), these study materials were robust and formed a complete package. And academics saw good reason to use them for both – their off- and on-campus cohorts – with obvious benefits for both. Both groups of students would study from the same set of materials, ensuring improved equity between cohorts and modes of study. The practice would release teachers from their over-reliance on delivering content in the lecture format and allow them more time to provide much needed feedback to learners, which is something that was being neglected before because of the time demands of lecturing.

By necessity, and because of the nature of the challenges it confronted, distance teaching institutions were spearheading the adoption of new and emerging media in education. And by the middle of the 1980s the first papers are being published on online and offline computer-assisted learning, for example, at the University of Missouri (see Andrews & Strain, 1985). Our analysis reveals that the predominant themes of the writing around this time are concerned with addressing and meeting the challenges of learning and teaching in the distance mode and using emerging technologies to bridge the naturally occurring divide between learners and teachers and their educational organizations.

Quality assurance in distance education (1990–1994)

The 1990s see growing interest in improving the overall quality of these initiatives with a focus on distance learning and teaching processes. A number of publications in the early 1990s were shaped by two major developments around this time. The first was the introduction of remote audio- and videoconferencing systems on a wider scale to support distance learning and teaching, and the second the growing rate of attrition from distance education. Figure 4 reveals six major commonly occurring themes: *education* (100%), *learning* (40%), *students* (35%), *system* (14%), *quality* (3%), and *remote* (2%).

An attraction of the growing numbers of distance teaching institutions around this time was their ability to offer educational opportunities to large numbers of students at

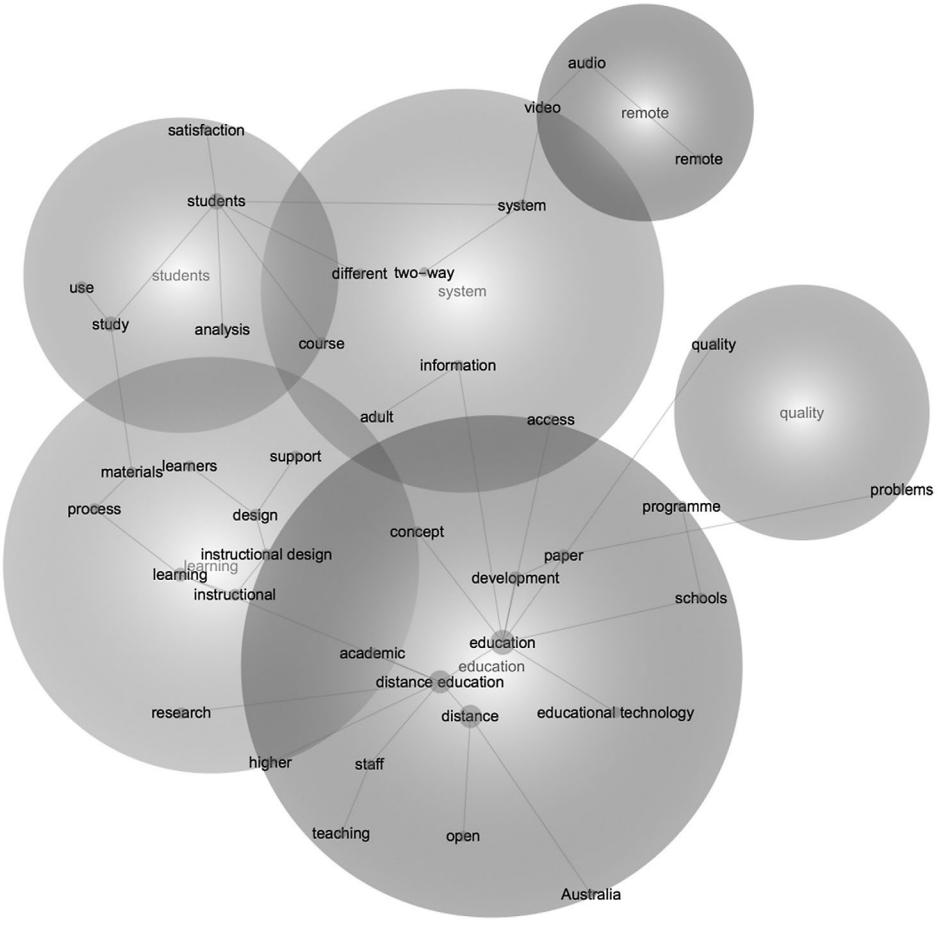

Figure 4. Concept map for the time period between 1990 and 1994 ($N = 56$ articles).

economies of scale with paper-based study materials to high numbers of students (Peters, 2001). The underlying principle of this mode of teaching was that:

> As student numbers increase, so the fixed costs can be shared among an ever-growing number of learners, thus gradually reducing the average cost per student. Provided that the variable costs of distance education – for tutoring or the distribution of materials in particular – can be held down, it then offers economies of scale. (Hülsmann, 2000, p. 30)

But the growth of large-scale open and distance education institutions – the so-called mega universities serving hundred thousands of students (cf. Daniel, 1996) – brought with them high attrition rates and issues around the quality of educational provision.

Researchers around this time began to develop tools and strategies to understand why students were dropping out from distance education (see Kember, 1981) or withdrawing, as well as why they were continuing with their studies (Roberts, Boyton, Buete, & Dawson, 1991). These issues were complex, and there were diverging views on how best to resolve or make sense of them. Peters (1992) argued, for instance, that dropout rates from distance education should not be compared across systems, as the parameters were significantly different between systems. Around this time, Eisenberg and Dowsett (1990) carried out a

study of student attributes and achievements in courses offered by the UK's Open University in order to help its staff with advising prospective students of various risks associated with dropping out and being able to distinguish between students requiring different levels of assistance and support.

These considerations led to student support being acknowledged as a 'critical link in distance education' (Dillon, Gunawardena, & Parker, 1992; p. 29). A total quality management approach was favored in order to increase student satisfaction with their learning experience by McIlroy and Walker (1993). This included use of newer and emerging technologies such as remote audio- and videoconferencing systems that were already being used in the 1980s. These tools were becoming more widely used in the 1990s to offer and support better two-way interaction among teachers and students (see concept path *students – system – two-way – video – audio – remote* in Figure 4).

However, synchronous communication comes with reduced flexibility and scalability, and it was cutting sharply into the arguments in favor of distance learning and teaching. As Daniel (1998) argued:

> Group teaching in front of remote TV screens? … is not only an awful way to undertake distance learning, but flies in the face of everything that we have learned while conducting successful open and supported learning on a massive scale for the past 27 years. (p. 1)

Publications in the journal in the first half of the 1990s saw researchers and scholars developing a deeper understanding of issues around quality and quality educational provision in the distance mode. And this was a focus that continued to show in publications in the second half of the decade as well.

Student support and early stages of online learning (1995–1999)

Publications over the years 1995–1999 are characterized by a focus on many of the same topics we saw being canvassed earlier on. These include *education* (100%), *learning* (92%), *use* (23%), and *instructional design* (22%) (see Figure 5).

Student attrition and quality assurance remains an important concern (e.g., Dean Nielsen, 1997; Mann, 1998). The key for ensuring high quality learning experiences in distance education was seen to be in the design of student-centered learning experiences and support systems with a focus on the needs and prior knowledge (*students – study – knowledge – prior*) of the individual learner. The concepts of *instructional design* and *development* are linked with *materials* and *students* via 'support' in the thematic region of *learning*. This reflects a deeper understanding of instructional systems design; hence the growing interest in and awareness among practitioners of systemic and systematic approaches to instructional design from the broader field of educational technology, in ensuring a high quality distance education experience. The first step in the instructional systems design process is the analysis of learners, their unique characteristics, prior knowledge, and their learning context. And a review of research on the role of prior knowledge in learning and teaching around this time proposed that the development of prior knowledge profiles of students is helpful in providing them with instructional support, and in enhancing a student's learning experience (see Portier & Wagemans, 1995). Balancing employment and family commitments with studying at a distance was a continuing challenge for distance learners (Murphy & Yum, 1998).

By now the Internet and the Web had been around for a few years, and the latter part of the 1990s began to see some interest in the potentials of virtual learning. Distance educators

Figure 5. Concept map for the time period between 1995 and 1999 ($N = 75$ articles).

were naturally interested in the affordances of the Internet and the Web for learning and teaching in the distance mode. An article by Falck et al. (1997) explored new developments in information and communications technologies and the opportunities they offered for schools to establish inter-institutional electronic networks (or virtual classrooms) to enhance the quality of education in smaller schools in sparsely populated countries like Finland (p. 213).

The concept of virtual classrooms was a new and an un-investigated phenomenon, although reports of subjects and courses offered in the virtual mode were beginning to emerge about then (see Naidu, 1997). This article reports on the design architecture of a graduate study program that was fully delivered via the Internet and on the Web. In the following years more and more papers were published about the pedagogical opportunities and affordances of new web-based information and communication technologies. They dealt with issues to do with the roles of tutors in designing online courses (Trentin & Scimeca, 1999), strategies for online teaching and learning (Oliver, 1999), and the potential of new media to enhance the quality of open and distance education (Kirkwood, 1998).

Figure 6. Concept map for the time period between 2000 and 2004 ($N = 75$ articles).

However, the majority of these reports at this early stage of web-based learning and teaching were single case studies of projects, initiatives and pilot courses by early adopters, reflecting a 'lone-ranger approach' (Bates, 2000, p. 59), rather than a strategic, institution-wide initiative. At this stage, the concepts of *educational technology*, *information* and *technology* did not form a thematic region of its own. This changed in the next time period.

The emergence of the virtual university (2000–2004)

The early years of the new millennium saw online learning moving into the mainstream of distance education provision, with growing interest in virtual learning and notions of the *virtual university*. Topics covered in publications over the 2000–2004 period include *learning* (100%), which overlaps with *education* (34%), *instructional design* (9%), *university* (4%), and *analysis* (3%) (see Figure 6).

Obviously, 'the proliferation of information and communications technology (ICT) in conventional campus-based educational settings was clearly blurring the traditional boundaries between distance education and campus-based face-to-face educational practices' (Naidu, 2003, p. 350). Online distance education was becoming a global phenomenon and giving rise to notions of distributed learning, a concept that sought to capture the distributed

nature of the new learning and teaching landscape. An article by Boshier, Brand, Dabiri, Fujitsuka, and Tsai (2001) examined the web pages of 231 virtual universities (or virtual campuses) describing them as portals for distributed learning. In this new and emerging educational scenario, learners and teachers could be distributed anywhere in the world, living in close proximity or afar, but they could and would be learning and teaching in a networked environment.

These were the early days of what was to become widely known as blended learning as institutions moved from single-mode (either face-to-face or distance teaching) to dual-mode activities (Tait, 1999). And around this time there is a clear shift in publications towards research on online learning. Concepts such as *learning*, *educational technology*, *online*, *course* and *delivery* are appearing as connected (see Figure 6). Fifty-four of seventy-five articles published between 2000 and 2004 deal explicitly with the development and design of online learning. Twenty-six of the seventy-five papers have the term *online* in the title, and there are another 12 with the terms *web-based*, *networked* or *virtual* in the title.

Researchers are fascinated by the enormous opportunities that the new information and communication technologies afford for collaborative online learning and teaching (see Bernard & Rubalcava, 2000). In the concept map for this period, *learning* is directly connected with *online* and *collaborative* and with *interaction*, *discussion* and *community*. Early in 2000 Garrison, Anderson, and Archer developed their widely cited community of inquiry model, which posits that learning occurs through the interaction of social presence, cognitive presence and teaching presence in computer conferencing educational settings (Garrison, Anderson, & Archer, 2000, 2001).

But the issues and challenges confronting online learning and teaching are not any different from those that confronted print-based distance education practice, and publications around this time reflect that. These include student participation and engagement in online discussion forums (see Kuboni & Martin, 2004), and the emerging role and responsibilities of the 'e-moderator' (Berge & Collins, 2000, p. 81) in the facilitation of interaction in the online learning environment. Other issues include the pedagogical affordances and constraints of 3D virtual worlds for synchronous interaction (Dickey, 2003) and the role of scaffolding to support self-directed learning in networked learning communities (McLoughlin, 2002).

As distance education crosses national boundaries with the help of the Internet and the Web (cf. McBurnie & Ziguras, 2007), there is some concern among scholars about cultural and ethical issues of international distance education (Bates, 2001; Wilson, 2001). This is reflected in the concepts of 'communication' and 'differences' being directly linked in the concept map for this period (see Figure 6). Articles such as the one by Pincas (2001) deal with how 'worldwide students encounter discourse problems rather than simple language difficulties. Yet their learning is judged by English western norms giving high value to criticality as well as "Standard English"' (p. 30).

Collaborative learning and online interaction patterns (2005–2009)

The second half of the first decade in the new millennium begins to see a picture of distance education emerging that would transform its face and image as we had known it. Online education is beginning to be seen as the new face of distance education. And because online education is new and technology driven, it is attractive and fashionable to all, and not just distance educators. People and organizations which had no background or experience in

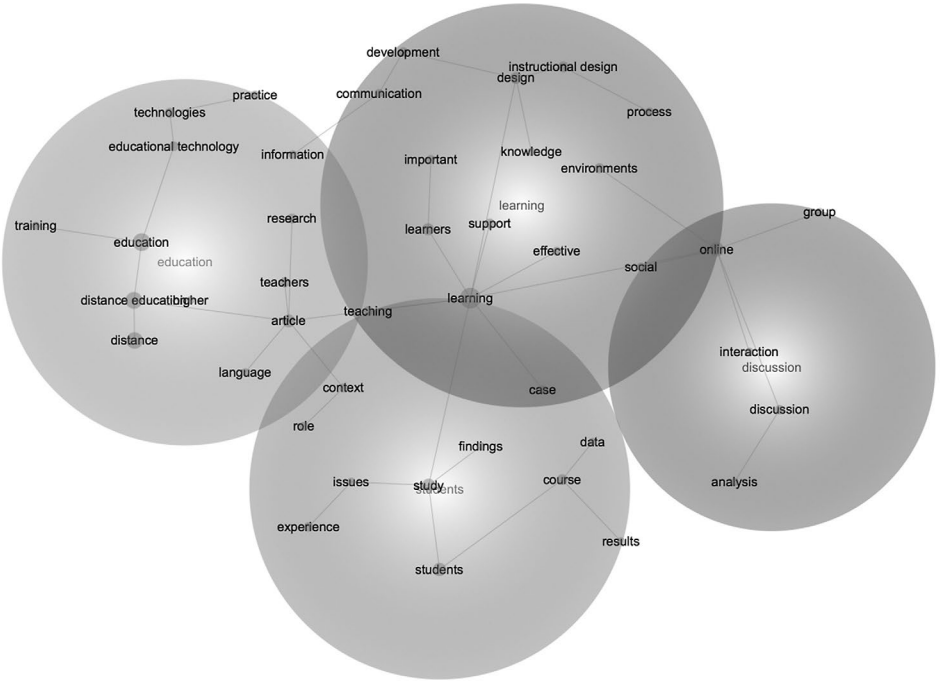

Figure 7. Concept map for the time period between 2005 and 2009 ($N = 101$ articles).

distance education are adopting and engaging with online education and mixing and matching modes of learning and teaching. Everyone is engaging in every mode of education regardless of their educational orientation. Distance education is on the move from the periphery to the center, and as Chuck Wedemeyer remarked, it was moving from 'Learning at the Back Door' to learning through the front door (see Wedemeyer, 1981).

With increasing numbers of people and educational organizations engaging with online distance education, the number of submissions to the journal for publication consideration increases, mostly from the United States of America which incidentally did not have a long and widespread history of distance education practice. But as distance education is becoming about online education, it is quickly becoming fashionable to be in this business, hence the growing interest in it.

As Figure 7 shows, the major topics canvassed in publications over these 5 years are *learning* (100%), *education* (96%), *students* (53%), and *discussion* (12%). Some of these topics are recurring themes, and some are new and emerging, such as the growing interest in interaction in online educational settings, a pattern that continues and gains even greater momentum over 2005–2009. Asynchronous computer-mediated communication, which is text-based ('texts that talk back', cf. Hülsmann, 2003, p. 75), offers researchers and teachers access to a large body of archived data from online discussion forums for further study and scrutiny. *Discussion* is emerging as a theme of its own with the concepts of *online – group* and *interaction* associated with it.

Several studies around this time seek to understand how collaborative learning occurs and how meaning is articulated and negotiated in light of constructivist instructional designs (cf. Jonassen, Davidson, Collins, Campbell, & Haag, 1995). For example, the article by Zembylas

and Vrasidas (2007) looks at how learners and instructors use and interpret 'silence' (i.e., non-participation, confusion, or thoughtful reflection) in online courses. And an article by Smith (2008) investigates the role of trust in community-building processes and participation in online conferences. While the majority of this kind of research on online interaction is qualitative in nature, Jeong (2005) offers a set of quantitative methods for evaluating, modeling and even predicting group interactions in computer-mediated communication.

Several case studies and studies of innovative instructional designs published around this time explore the full potential of digital media in collaborative online learning. The article by McLinden, McCall, Hinton, and Weston (2006), for example, discusses problem-based learning scenarios in a teacher-training program, and the article by Fahy (2007) investigates the power of stories and the role of storytelling in the sharing and construction of knowledge in constructivist learning environments. In a widely cited paper, Beldarrain (2006) provides an overview of the pedagogical opportunities Web 2.0 applications and social software afford for teaching and learning in the distance mode.

As the development of online or web-enhanced courses increases in many higher education institutions around this time, many distance teaching institutions, among them the world's largest mega-universities, are still struggling with the introduction and implementation of online learning on a large scale. As Luschei, Dimyati, and Padmo (2008) write, 'While the Open University [of Indonesia] has considerable capacity in print-based and CD-ROM-based instruction, the university must begin to provide its students with greater online learning opportunities' (p. 169). For such big ships with hundreds of thousands or even millions of students, it is difficult to respond to the very dynamic developments in the field of online education. Without the support of faculty members and professional staff development, institution-wide innovation processes are likely to fail. Some studies begin to explore the knowledge, skills and attitudes of lecturers, in particular with regard to motivating and de-motivating factors for participating in online education, such as at Anadolu University in Turkey (Akbulut, Kuzu, Latchem, & Odabaşi, 2007). In the concept for this thematic region, *education*, *distance education* is associated with *technology* and *practice*, and with *training* and *teachers*.

This time period also marks the development of special themed issues of the journal on a regular basis. And the growing interest in the importance of research areas such as instructional design for collaborative online learning facilitated by new information and communication technologies is captured by five special themed issues of the journal which were published in 2005, 2006, 2007, 2008, and 2009. Themes covered by these issues were 'Learning design', 'Effective, efficient and engaging learning in the digital era' and 'Distance education technologies – an Asian perspective', 'Online distance education', and 'Distance education: Past contributions and possible futures'.

Interactive learning, MOOCs and OERs (2010–2014)

Over the next five years (2010–2014), the theme *interaction* (12%) continues to be the critical mediator between *students* (69%) and *learning* (41%), while the design of technology-enhanced collaborative learning experiences remains the major focus of the articles (e.g., Guasch, Espasa, Alvarez, & Kirschner, 2013; Persico, Pozzi, & Sarti, 2010).

This period also marks the emergence of *MOOCs* (massive open online courses) (1%), a concept that is directly connected with *education* (100%) (see Figure 8). With growing interest

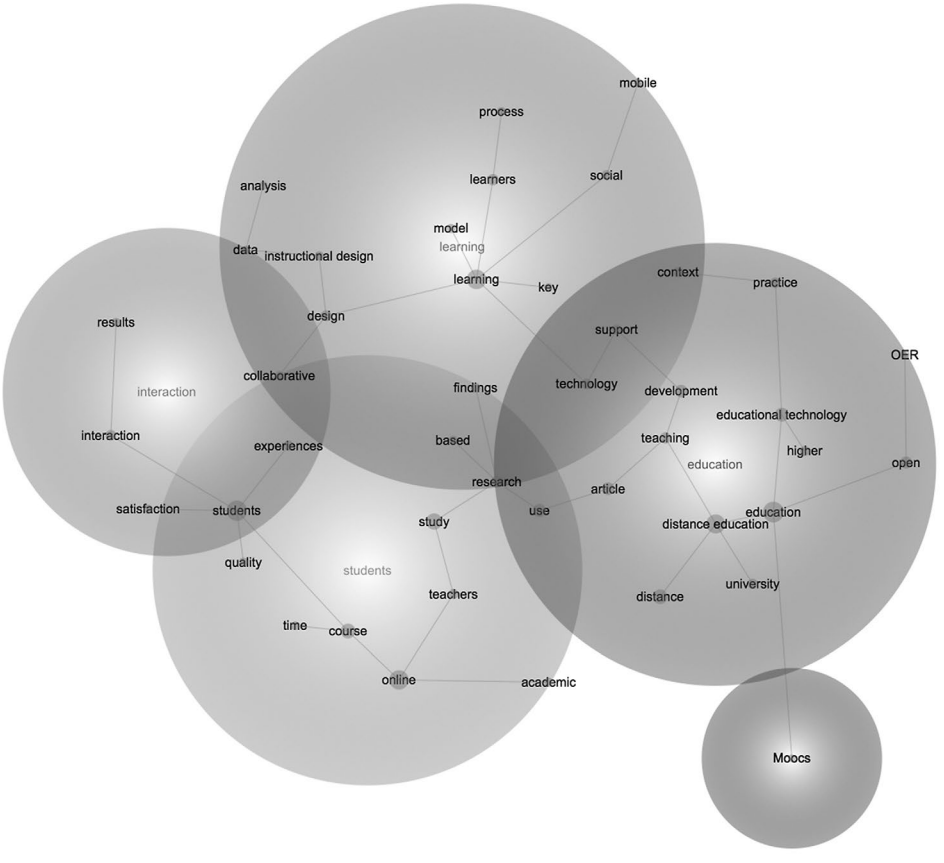

Figure 8. Concept map for the time period between 2010 and 2014 ($N = 102$ articles).

in open educational resources (OERs), there is increasing fascination with MOOCs. Two special issues of the journal pick up these themes for more in-depth exploration, 'OERs and social inclusion' (2012) and 'MOOCs: Emerging research' (2014). OERs are also a big feature of the special themed issue of the journal on 'Distance education for empowerment and development in Africa' (2011).

OERs and MOOCs date back to the open access movement that was started by the Budapest Open Access Initiative in 2002, which declares that knowledge is a public good that should be distributed via the Internet without cost to the user. Open access to learning resources is seen as a way of responding to the huge demand for education and training worldwide. The concepts *OER* and *open education* are directly related to *MOOCs* (see Figure 8). The educational implications for both these concepts are explored in the article by Richter and McPherson (2012), which discusses the potential of OER for developing countries in overcoming the educational gap and fostering social justice, freedom and equality. Other papers at this time elaborate how OERs can be integrated into the curriculum, such as Harley (2011), which reports on the Health OER Inter-Institutional Project in Ghana and South Africa.

The development of MOOCs is traceable to an online course, 'Connectivism and Connective Knowledge', offered at the University of Manitoba in Canada (Liyanagunawardena, Adams, & Williams, 2013; Siemens & Downes, 2011). Essentially, a MOOC is an open online course

(Cormier, 2010). And so far there seems to be two distinct types of MOOCs that are being built (see Daniel, 2012). The first one, labeled as c-MOOCs (cf. Siemens, 2005), considers the development of knowledge as an outcome of discussion and debate in a networked educational environment (see Siemens & Downes, 2011). In this context, learners and teachers are equal partners and contributors to the generation of knowledge. The other type is driven by mini video lectures by experts, which are followed up with online discussion forums and quizzes. These are called x-MOOCs (edX, 2013).

A need to capture the forays and the earliest rounds of research into this form of online education led to the allocation of a special themed issue of the journal to this topic (volume 35(2): 'MOOCs: Emerging research'). In this special issue, while many of the articles focused on aspects of technology (e.g., platforms, automatic grading) and economics (e.g., scalability, productivity) the article by Fischer (2014) analyzes MOOCs from a pedagogical and psychological perspective and puts it into a broader context of learning and education. And the article by Marshall (2014) addresses ethical concerns associated with MOOC practice and research, despite the euphoria surrounding the phenomenon.

Although there was also a special issue devoted to 'Mobile learning' (2010), the concept of mobile learning is not prevalent in the concept map in the period (see Figure 8). Part of the reason for this could be that with the recent development of digital devices that are all mobile and un-tethered (smartphones, tablet PCs, laptops) and the decline of the use of the desktop computer, the distinction between mobile learning and online learning might not make sense anymore, whereas online distance education might be an appropriate umbrella term that captures all and which seems to be capturing the imagination of researchers and scholars at this time (cf. Brindley, Wälti, & Zawacki-Richter, 2004).

Waves of alternating institutional and individual research perspectives

We acknowledge that this mapping of the contents of one journal in the field offers us but one window into the development and progress research and scholarship in distance education over the past 35 years. Mapping of the contents of comparable journals in the field as well as proceedings of key conferences from overlapping time periods would be a useful complement.

Nevertheless, this mapping of the contents of *Distance Education* (a major journal in the field) over the first 35 years of its existence offers important insights into the development and progress of research and scholarship in the field. And the application of Leximancer™ for interrogating a large body of text such as this has been instrumental in revealing these insights. Three waves of alternating institutional and individual research perspectives are observable from this study of trends in 35 years of publications in the journal (see Figure 9). These are as follows: (1) consolidation of distance education institutions and instructional design; (2) quality assurance and student support, and (3) the virtual university, and online interaction and learning.

Institutional research perspectives have a focus on meso-level issues (i.e., management, organization and technology), and individual research perspectives focus on issues related to the micro-levels of teaching and learning in distance education (see Zawacki-Richter, 2009). These are briefly elaborated in the following. We acknowledge that this characterization of research and scholarship in distance education as alternating waves of institutional and individual research perspectives is a view of the terrain as projected by one journal in

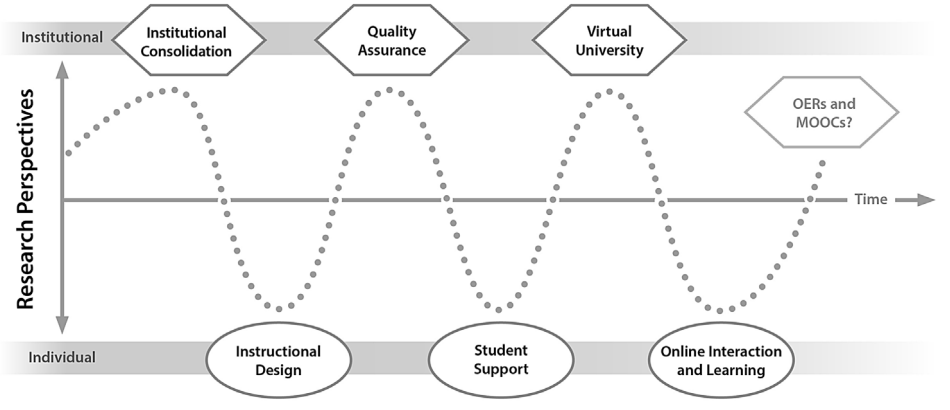

Figure 9. Alternating institutional and individual research perspectives over time.

the field in which the views, perceptions and perspectives of its editors, editorial board and reviewers of submissions to it will have played an important part.

Phase 1. Consolidation of distance education institutions and instructional design

As a new and somewhat revolutionary form of educational practice, the establishment of distance teaching organizations and distance education systems posed an enormous organizational challenge in the early years of its emergence. It is not surprising, then, to see that the first round of research and writing on distance education is largely concerned with issues and challenges to do with organizational management and professional practice. This also included the development of curricula, courses and learning materials, hence the interest in instructional design, which is something that was not endemic to conventional face-to-face education, especially in the higher education sector.

Phase 2. Quality assurance and student support

Once the first set of distance educational organizations were on their way, assuring quality was important not only to ensure a high quality of learning and teaching experience, but also to ensure parity of esteem with conventional educational practices, which was considered the benchmark (see Jevons, 1987). This is reflected in the attention to quality assurance in publications around this time, and their focus on issues to do with student attrition and student support in a non-contiguous independent educational environment.

Phase 3. The virtual university, and online interaction and learning

Around the turn of the new millennium, the emergence of the Internet and the Web, as well as mobile computing, altered the dynamics of this focus on quality assurance somewhat with an invigorated focus on the affordances of these technologies for communication, collaboration and interaction among students, and students and their teachers. These technologies also brought with them initiatives and developments such as OERs and MOOCs, which would revolutionize educational provision and promote distance education into the

mainstream from an existence on the periphery of educational opportunity (see Naidu, 2014). And while developments in relation to OER and MOOCs are still evolving (cf. Raffaghelli, Cucchiara, & Persico, 2015), it is clear that online educational technologies will play a critical role in education broadly, and especially in relation to an education for all agenda. This means that the future for distance education looks bright and promising. In fact, there has never been a better time to be in the field of open, flexible, distance and online education than now!

Disclosure statement

No potential conflict of interest was reported by the authors.

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