THEME 1: HISTORY, PHILOSOPHICAL AND THEORETICAL APPROACHES, AND PARADIGMS IN DISTANCE EDUCATION

As a first theme the chapters will focus on philosophical prerequisites that featured in distance education research since its inception and continues to play a role in this field. Three distinctly different chapters will focus on development in distance education and particular philosophies and theories underpinning distance education theory and practice.

Chapter 2:

Tracing Distance Education Research: The Influence of Technological and Pedagogical Developments

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Introduction and chapter 'map'. A brief overview of the chapter, its theme, and purpose

In this chapter, the researcher discusses the technological and pedagogical developments in distance education and their influence on distance education research, suggesting future trends. The different generations of distance education are tracked and linked to the pedagogical approaches' dominant in each generation. Key research issues in each generation are also discussed in line with the advances in technology and pedagogy. The issues such as content, focus, philosophical assumptions, and methods shall be explored in understanding the development of distance education research. The chapter will concentrate on the macro, meso, and micro levels of content in studies on remote education (Bäcker and Vogt 2009). Examining the main theories that guide research on distance education, as well as examining the prevalent research methodologies and strategies in distance education research, is also obligatory in this chapter. In order to provide new paradigms for remote education research, the chapter will conclude by offering advice on the direction of the field. The figure below summarises the thrust of the chapter.

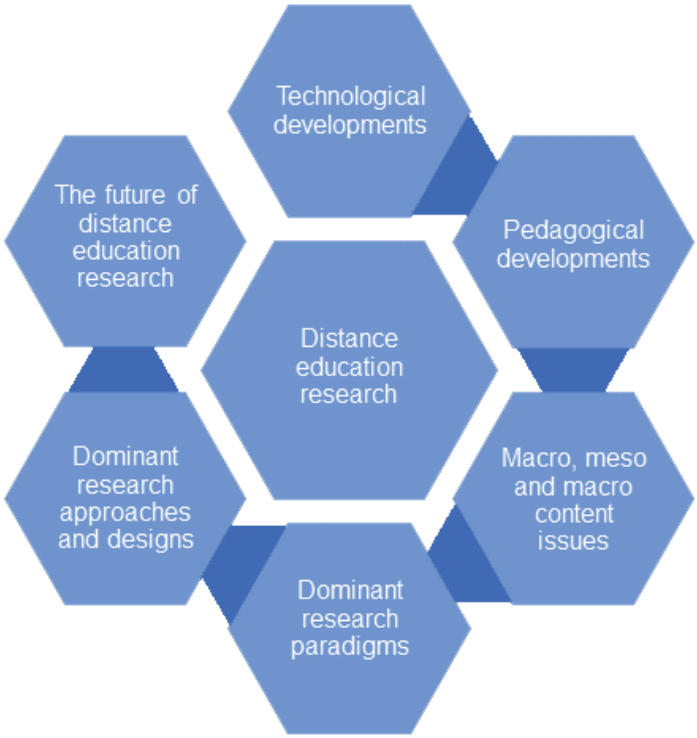


Figure 1: Chapter focal areas

Technological developments—the generations of open and distance learning

According to Taylor (2001), there are five generations of distance education in line with technological developments.

Table 1: The five generations of distance education according to Taylor (2001)

Generation	Model	Dominant technologies utilised
First generation	Correspondence Model	Print
Second generation	The Multimedia Model	Print Audiotape Videotape Computer-based learning Interactive video (disk and tape)
Third Generation	The Tele-learning Model	Audio teleconferencing Videoconferencing Audio graphic Communication Broadcast TV/Radio Audio/teleconferencing
Fourth Generation	The Flexible Learning Model	Interactive multimedia (IMM) online Internet-based access to WWW Computer-mediated communication
Fifth generation	The Intelligent Flexible Learning Model	Interactive multimedia (IMM) online Internet-based access to WWW resources Computer-mediated communication, using automated response system. Campus portal access to institutional processes and resources
Emerging generation	Emergent model	Web 2.0 tools Artificial intelligence Augmented Reality (AR) Virtual Reality (VR)

Adapted from Taylor (2001: 3)

As noted by Taylor (2001) and illustrated in Table 1, there have been significant technological developments in distance education since the correspondence model, which predominantly utilised print material in course content delivery. The fifth generation and the emerging generation through emergent technologies underscore how learning has become flexible, convenient, mobile, self-paced, self-directed, and highly engaging through the utilisation of different technologies in synchronous and asynchronous ways. The use of technologies in distance education has heightened collaboration, creativity, conversation, community, and control in learning (Hicks and Graber 2010). The use of mobile devices enables learners to learn on the go. As further noted by Ahmad (2020), through the utilisation of technologies there is enhanced collaboration, communication, and creativity in distance learning.

Focus on online distance education

Online delivery is given a lot of importance in the present generation of distance education. The new standard for teaching and learning is now primarily conducted online. Learning has undergone a revolution as a result of the usage of the internet in teaching and learning which allows for unrestricted learning (Carruth and Carruth 2013). According to Verawardina et al. (2020: 386) online learning is 'learning that uses internet technology that allows teachers and students to carry out learning wherever and whenever outside the classroom'. The online approaches in distance education have numerous implications for research in distance education. There are some prerequisites for online distance education, especially in developing contexts and such prerequisites are pointers to research in online distance education. Table 2 summarises some of the prerequisites.

Table 2: Prerequisites for meaningful online teaching and learning

Infrastructural	Technological	Pedagogical
Appropriate internet bandwidth	Appropriate technological devices	Online course design
Stable and reliable internet	Ability to utilise the technological devices	Online facilitation/ assessment skills

Relevant technology such as learning management system	Ability to navigate the LMS	Online learning skills
Software/hardware licencing	Learner/focus instructor technological support	Suitable online learning material

The infrastructural, technological, and pedagogical prerequisites shown in Table 2 indicate a plethora of possible research areas to be undertaken to establish the meaningful implementation of online distance education in developing and deprived contexts. Such research would inform policy and practice on ODeL planning and delivery. As noted by Wollscheid, Stensaker, and Bugge (2019), effective education policies should be grounded on empirical research and draw on its findings. Policy and practice for ODeL planning and implementation are informed by empirical research in emerging environments, taking into account the specific and unique contextual factors. In understanding online teaching and learning, Van Wart et al. (2020) note some critical success factors such as instructional support, teaching presence, cognitive presence, online social comfort, online interaction, and social presence. This shows that the actual implementation of online teaching and learning should be researched in an attempt to suggest ways of improving practice.

Understanding developing contexts in higher education

As noted by Sharma, Jain, and Mogaji (2020), higher education systems are undergoing a paradigmatic shift as they embrace digitisation, yet there are inherent challenges to such transformation in developing contexts, which are higher education systems in developing countries. Some of the challenges of higher education systems in general and distance education systems in particular, are socioeconomic in nature (Mogaji and Jain, 2020). In instances where there are resource constraints and disparities in resource distribution, there will be challenges to access to distance education and effective delivery of distance education. Given technological developments in transforming distance education through online teaching and learning, there is a need for concerted efforts by governments and other stakeholders to invest in technological developments. Therefore, in understanding developing contexts because of open and distance e-learning provisioning, Figure 2 notes some of the pointers.

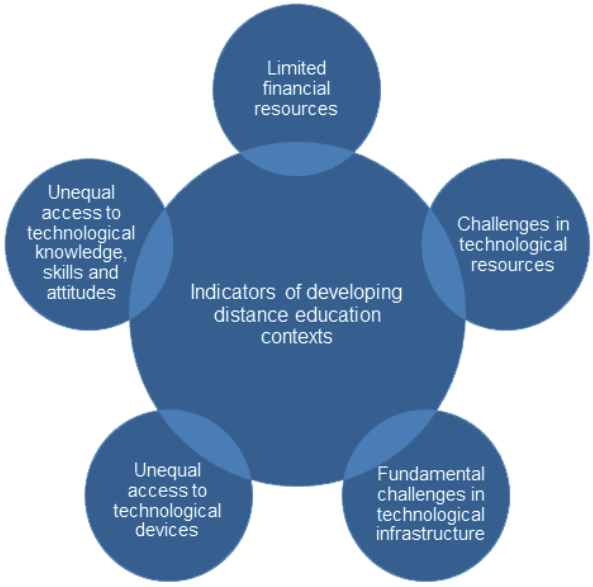


Figure 2: Developing distance education contexts indicators

Figure 2 alludes to the realisation that discussion of research in distance education in developing contexts should be understood in the context of lack and unequal access. The context becomes a research issue as there is a need to establish the nature, extent, as well as possible solutions to issues of resource constraints and unequal access. Therefore, as distance education institutions in developing contexts transition to online distance education, there is a need for research to be conducted to understand this transition, feed into policy, and assist in the meaningful implementation of online learning in the distance education institutions.

There are also contextual differences, with distance education institutions in developing countries operating at different levels. The disparities in institutions, invariably, impact the quality of online learning participation in terms of success in learning (Chávez et al. 2021). Issues such as access to technological devices for use in online learning, internet connectivity, as well as the pedagogical approaches employed by the course instructors contribute to disparities in the online learning experiences by learners. It is therefore vital to consider distance education research in terms of the unique contexts. Implementation of the integration of technologies for the enhancement of distance education delivery differs from one context to another, hence the need for systematic examination of research issues within specific contexts.

Implications for research in ODeL

In undertaking distance education research, it is always important to consider technological developments. Among other issues, researchers should interrogate the usability and efficacy of the technologies in ODeL delivery. Research could be carried out by establishing the views of the users such as course instructors and learners. Similarly, some technologies may be tried out and evaluated as a form of action research meant to improve practice. The following questions may be raised as informing ODeL research in line with technological developments:

- What are the predominant technologies utilised in ODeL delivery in a given context?
- How has ODeL delivery improved as a result of the utilised technologies?
- What are the structural, cultural, and agential enablers and constraints in the use of technologies in a given context?
- How do the users experience the use of technologies?
- What are the advantages, disadvantages, strengths, and weaknesses in the use of particular technologies, and what could be done to enhance technology use?
- What is the impact of technology use in ODeL delivery on access to distance education and the attainment of learning outcomes?

These are some of the questions revolving around the technological developments in distance education that may influence research areas that could be undertaken by ODeL researchers.

Pedagogical developments in distance education

There have been pedagogical developments in distance education delivery over the years. The understanding of these developments is important in distance education research. Research into pedagogical aspects results in an evidence-based approach to the selection and utilisation of appropriate teaching and learning approaches (Herodotou et al. 2019).

The pedagogical developments in distance education are linked to the different generations of distance education (Anderson and Dron 2011). The Figure below summarises the distance education generations and pedagogical approaches dominant in each generation.

Table 3: Pedagogical developments in distance education

Type of generation	Dominant pedagogies	Implications for ODL delivery
First generation	Cognitive-behaviourist pedagogies	Use of pre-packaged learning materials Print modules with structured content Objectives-centred learning and assessment Use of self-instructional activities Use of self-assessment activities Minimal or no interaction between learners and course instructors, as well as among learners
Second generation	Social-constructivist pedagogies	Active instead of passive learning Learning is more of a social activity Available technologies assisted in bringing more students' social presence in learning Learning is more learner centred More social learning approaches
Third generation	Connectivist pedagogies	Students learn by building connections with others online Ubiquitous learning opportunities online Synchronous and asynchronous learning approaches Participation in online learning communities Online connection with instructors, fellow learners, course content, and learning materials

Adapted from Anderson and Dron (2011)

The pedagogical developments in distance education as illustrated in Table 3 have profound implications for distance education delivery as well as research in distance education as explained in detail below.

Cognitive-behaviourist pedagogies and implications for research in distance education

The cognitivist-behaviourist pedagogies are rooted in two traditional learning theories: behaviourism and cognitivism. Behaviourism, as a learning theory, states that learning is external and responds to stimuli (Bush 2006). Furthermore, behaviourists advance the view that 'only observable, measurable, outward behaviour is worthy of scientific inquiry' (Bush 2006: 14). Several behaviourist principles are evident in distance education delivery, even up to the present day. These are principles such as practice, modelling, reinforcement, and active learning. Practice notes that distance learners should be provided with opportunities to practise what they would have learnt. The printed instructional material in the earlier generation of distance education were designed in a self-instructional manner. Despite the rapid utilisation of technology, printed material is still prevalently used in distance education delivery in developing contexts (Gaba and Dash 2004). As noted by Iqbal, Mahmood, and Idrees (2019), the printed self-instructional materials are designed with particular units, each unit has objectives, and the course content and activities are linked to the unit objectives. The self-instructional material replaces the course instructor as the learner can go through the course content and engage in the embedded practice exercises. The components of objectives and practice exercises are rooted in the behaviourist principle of practice.

The cognitivist school of thought views learning as an active, internal process in which the learners' mind is actively engaged in comprehending and processing their experiences of the outside world (Good and Brophy 1990). In addition, insight, information processing, memory, and perception are key components of the cognitivist approach, and the knowledge that is processed is typically stored in and retrieved from memory. In the delivery of ODL, it is necessary to make sure that students interact with the course material through thoughtfully created learning tools in ways that encourage them to use their minds and engage in higher-order thinking (Ally 2008). ODL environments offer an opportunity for active learning for students.

Given the cognitive-behaviourist pedagogies in distance education delivery, the researchers may interrogate related issues from a cognitive-behaviourist inclination as shown in Figure 3.

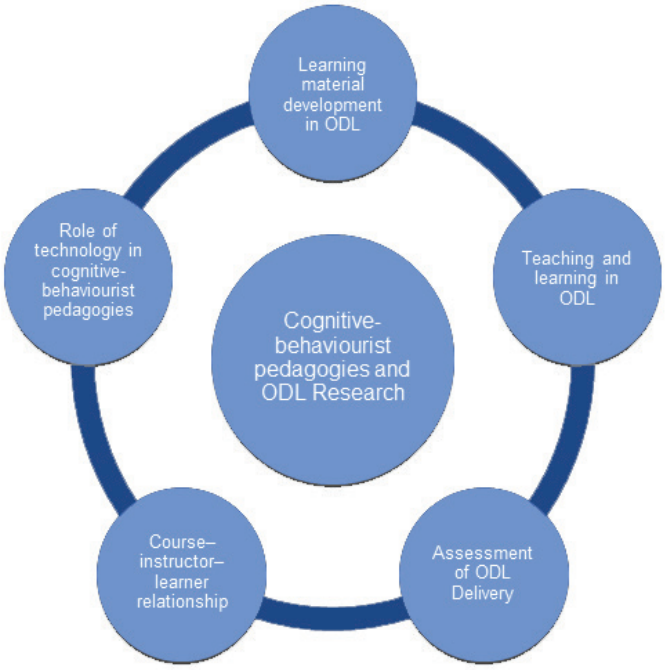


Figure 3: Cognitive-behaviourist pedagogies and ODL Research

Learning materials in ODL

The importance of learning materials in distance learning cannot be overemphasised. The learning materials are utilised in different multimedia formats and constant and sustained research should be conducted on learning material design, as part of instructional design, and the utilisation of such materials in different contexts. The purpose of such research would be to understand the pedagogical and theoretical underpinnings of learning material design and utilisation in distance learning**.** The way learning materials are developed and utilised in the ODL context is heavily informed by the pedagogical persuasion, hence the need to interrogate learning materials within the cognitive-behaviourist pedagogies. As noted by Ally (2008), the use of technologies in ODL

delivery, as informed by cognitive-behaviourist pedagogies, should be considered in ways in which learning is enhanced. Bates (2015) notes the importance of pedagogy before technology, underscoring the need for establishing the pedagogical persuasion first and then employing technology to advance the established pedagogical approaches.

Teaching and learning in ODL

Research in ODL may also focus on the role of technology or online teaching and learning as informed by the cognitive-behaviourist pedagogies. There are some principles of the behaviourist and cognitivist theories that could be utilised in the instructional design and implementation of online teaching and learning. Basing teaching and learning on predetermined learning objectives to achieve specific outcomes borrows from behaviourism, as learning is geared towards attaining the set objectives or outcomes which is behavioural change. The utilisation of game-based elements in online teaching is a reward and a reinforcement aspect drawn from behaviourism. Therefore, as researchers interrogate teaching and learning in a technology-enhanced learning environment, there is always a need to note the role of cognitive-behaviourist pedagogies in modern-day ODL delivery.

The use of problem-centred online activities which allow learners to work online on solving real-life problems by applying their minds is an important aspect of cognitivism. Learners are not passive but active in processing knowledge to solve problems. Furthermore, Papadopoulou and Palaigeorgiou (2016) state that interactive videos may be utilised to promote online, self-directed learning. As the learners engage with the videos by applying their minds, they become active and self-directed learners which are important principles of cognitivism. It is therefore vital for ODL researchers to research teaching and learning issues in a technology-enhanced environment by addressing the theoretical basis of such teaching and its usefulness in ODL delivery.

Assessment in ODL

Research in distance education as informed by the cognitive-behaviourist pedagogies may focus on assessment issues. Assessment for learning and assessment for learning should be interrogated in terms of how they impact the quality of distance education teaching and learning. As noted by

Conrad and Openo (2018), assessment in distance learning should not be viewed solely as grading the learners but should be considered holistically in the context of providing efficient and effective distance learning practices by utilising proper and suitable assessment practices. The different types of assessments such as self-assessment, peer assessment, and instructor-led assessment should be explored fully to understand how they are planned and implemented, as well as their contribution to the quality of continuous distance learning (Adanir 2021). Furthermore, Adanir (2021) notes the utilisation of appropriate assessment methods that provide learners with opportunities to transfer knowledge to real-life contexts.

Course instructor-learner relationships

Because of the cognitive-behaviourist pedagogies, there is also a need to research course instructor and learner relationships in distance education. It would be important to establish such a relationship given the principles of behaviourism and cognitivism in distance learning. On the issue of positive reinforcement, for example, it would be vital to understand how this principle works in different contexts and how course instructors encourage the behaviour of distance learners who are physically and geographically separated from the course instructor (Croft, Dalton and Grant 2015). Similarly, the principles of shaping and modelling associated with behaviourism may need to be understood in the broad milieu of distance teaching and learning processes. At the heart of cognitivism is how learners construct knowledge by engaging mentally with the course content (Ertmer and Newby 2013). It is, therefore, vital to understand the role of learners and course instructors in distance learning informed by cognitivism.

Technology in ODL

The role of technology in distance teaching and learning, informed by cognitive-behaviourist pedagogies, is a broad research area, especially in developing contexts. According to Chen (2011), the behaviourist approaches had huge influences on technological developments in teaching and learning such as programmed instruction, individualised instructional approaches, and computer-assisted learning. It would be important to research the role of technology in the teaching and learning environment informed by behaviourism in distance education. The role of technology

in distance education teaching and learning as informed by cognitivism is worth exploring as technology is utilised in different ways to ensure that distance learners mentally engage with the course content. Anderson and Krathwol (2001) modified Bloom's original taxonomy of educational objectives by adding 'creating'. This suggests that with technology higher order skills should be promoted by teaching learners to create artefacts in a technological environment. As further noted by Ertmer and Newby (2013), given cognitivism, technologies should be utilised to promote active learning as the learners take active control of learning through self-planning, monitoring, and self-assessment techniques.

Social-constructivist pedagogies and implications for research in distance education

In this second generation of open and distance learning (the social-constructivist pedagogies) active instead of passive learning is emphasised, and learning is considered a social activity (Gergen 1995). The fact that distance learners are ordinarily separated from the course instructors and fellow learners call for scholarly research into how distance learning could be made more social and interactive. The utilisation of available technologies that could be harnessed to enhance interactivity and learner-centredness is another research area which could be interrogated from the point of view of the learners and the course instructors. As noted by Vygotsky (1978), social constructivism learning involves social, cultural, and language-based processes and there is a need to investigate the said three elements as they are applied to distance learning.

Connectivist pedagogies and implications for research in distance education

In line with the latest developments in distance education the online aspect has transformed the delivery system and has brought up new research focus areas, especially in the developing contexts. Connectivism is regarded as the learning theory for the digital age (Siemens 2005). The theory seeks to explain how learners learn in a networked environment and advances the view that learners learn by making online connections with fellow learners, course instructors, and content (Siemens and Downes 2009). The distance education researchers require exploring the different

aspects of online distance learning as informed by the connectivist pedagogies. The effectiveness of online delivery in terms of teaching, learning, and assessment are some of the topical issues in distance education research.

In the next section, possible research areas in distance education research are discussed using the classification by Zawacki-Richter, Bäcker, and Vogt (2009) of macro, meso, and micro areas.

Macro, meso, and micro research content areas

There are ways of classifying the content areas in distance education research. Zawacki-Richter, Bäcker, and Vogt (2009) call these macro, meso, and micro areas.

Table 4

Macro issues	Meso issues	Micro issues
- access, digital divide	- organisation of online learning systems	- online course design
- policy	- management of the online learning systems	- interaction and collaboration
- frameworks	- the technologies	- pedagogical issues
- technology infrastructure (equipment, hardware, software)	- staff training and support	- learning communities
- online learning systems	- student training and support	- online learning styles
- theories informing online learning	- quality assurance	- online teaching/learning opportunities and challenges

Macro issues and their influence on distance education research

The broader issues of access to higher education in the developing contexts remain critical areas for

research. Sub-Saharan African countries have very low participation rates in higher education, and female students are also underrepresented (Amin and Ntembe 2021). There is a need for distance education research to explore the nature and extent of higher education participation in Sub-Saharan Africa and the contributory factors, challenges, and role of distance education in enhancing access to higher education. The open and distance learning system is the answer to the problems with access to higher education, since it is accessible in terms of entry points and gives those who need the flexibility to study while engaged in other life commitments (Maphosa and Bhebhe 2020). According to Nigam and Joshi (2007, cited in Kuruppuarachchi and Karunanayake 2017: 42) '...the ODL delivery system has been observed as a reasonable and viable alternative to individuals who were denied education due to one reason or another.' There are many researchable sub-areas in the provisioning of access components of distance education that are worthwhile to pursue.

Access to higher education through open and distance e-learning has been further enhanced by the utilisation of digital technologies and open educational resources (OER)—this has resulted in open mass access as online education is offered through various digital learning platforms (Alevizou 2015). The delivery of online learning in developing contexts is an important area of research as it is also tied to the issue of the digital divide. It is vital to explore online learning in contexts where there are differences in access and abilities in the utilisation of digital technologies. The important aspects of social justice in education should be brought to the fore in instances where higher education through online distance education should address equity and equality concerns.

All the different aspects of online distance education such as the technology infrastructure in terms of equipment, hardware, and software are important aspects for distance education research in developing contexts. As noted by Dlamini and Ndzinisa (2020), universities in developing countries encounter serious challenges regarding the full and meaningful implementation of online learning, hence the need to have more research into such challenges to proffer solutions on what could be done to address them and ensure effective delivery of online learning. Furthermore, the utilisation of the different digital learning platforms is a research issue as meaningful online delivery depends on the technological and pedagogical abilities of the course instructors.

At the macro level of distance education research, an important issue in line with online teaching and learning is the issue of theories informing and underpinning online delivery. Contemporary learning theories such as the online collaborative theory (Harasim 2012), connectivism (Siemens 2005), and the community of inquiry framework (Garrison and Archer, 2001) which should feature prominently in current distance education research are informing online teaching and learning. According to Harasim (2012), the online collaborative learning (OCL) theory underscores the

importance of creating and sustaining online learning environments that promote collaboration and knowledge building. Similarly, the connectivism theory places emphasis on learning through forming online connections, whilst the community of inquiry presents the importance of the three presences, teaching cognitive and social presences in creating rich and rewarding online learning experiences. The said theories may be utilised as theoretical underpinnings for online teaching and learning and may also be fully researched as separate theories. The traditional and classical learning theories also remain relevant in distance education research.

Meso issues and influence on distance education research

The distance education researchers may look at the organisation of online learning systems as a meso issue of distance education research. Online learning ordinarily takes place on a defined learning management system also known as a digital learning platform such as Moodle, Blackboard, Sakai, Google Classroom, or others. As noted by Srichanyachon (2014), a learning management system (LMS) is a web-based software application that is specifically developed and designed to perform different functions such as content delivery, content, student interaction, learning and learner assessment, as well as reporting on learning progress and learner activities. Research should focus on how learning is organised on the LMS, the way content is delivered, how learners' interest and assessment is conducted, among numerous other issues in the organisation of online learning systems.

To understand how online learning is carried out and how it could be improved, it is important to undertake studies on the various technologies used, such as digital whiteboards. Technologies are important forces behind educational innovation because they are used to change how students learn (Reguera and Lopez 2021). Therefore, it is crucial to examine how various technologies are used, particularly in developing countries, to determine their value for delivering online learning. To ensure the meaningful use of the technologies and the general acceptability of their use, it is crucial to train and support course instructors and students in their use.

Micro issues and their influence on distance education research

Several micro issues could be researched in line with the technological developments in online

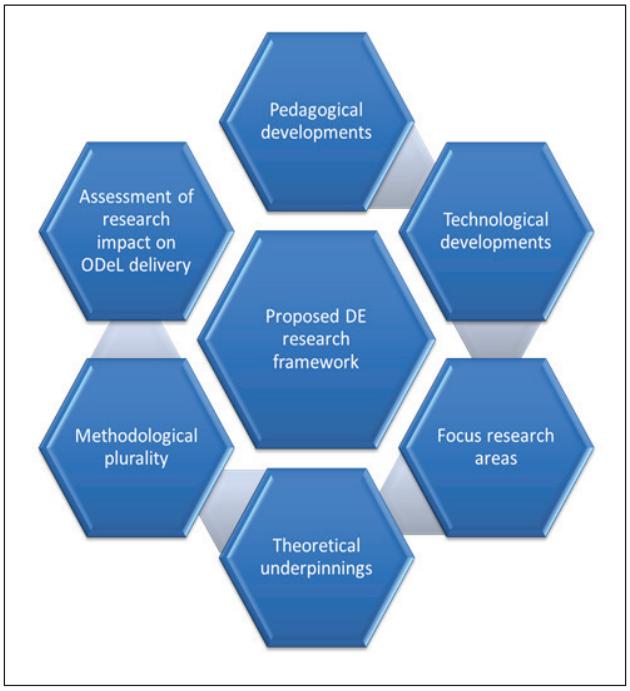
teaching and learning. The issue of online course design is very important as meaningfully online course design separates true online learning from emergency remote teaching. Stewart and Lowenthal (2022) note that comparing online learning with emergency remote teaching is comparing apples with oranges as the two are different. Emergency remote teaching is unplanned and temporary as an alternative to teaching during a challenge like a pandemic, yet online learning is a well-defined paradigm which commences with effective online course design. As stated by Brigance (2011), there is a need to ensure that higher education institutions offering online learning develop the capacity of course instructors to develop high-quality online courses. Instructional design issues are, therefore, important issues for research investigation as meaningful online learning stems from the designing of appropriate online courses.

The way learners learn in online courses is worth researching as indicators of effective and meaningful online teaching and learning. The way the learners interact and collaborate in online learning is critical in the attainment of learning outcomes in online courses. The nature and extent of interaction and collaboration in online learning are critical success factors in an online course (Razali, Ahmad, and Noor 2020). Tied to the issues of collaboration and interaction in online learning are the overall online pedagogies. According to Archambault, Leary, and Rice (2022), there are five pillars of online teaching expected of a course instructor, and these underpin the online pedagogies. The pillars are the course instructor's ability to build online relationships and an online learning community, utilisation of active learning strategies online, enhancing learner control of online learning processes, personalising the learning process, and embracing mastery of learning.

Online teaching and learning opportunities and difficulties should be the main topics of online learning research. To take advantage of the benefits and address the obstacles, the entire online teaching and learning scenario should be examined from a variety of angles. There are several obstacles to online teaching and learning in developing environments, hence it is essential to analyse the kind, scope, and effects of these obstacles on online learning delivery systems. Comparative studies also help in learning how online teaching and learning are applied in various contexts and under various circumstances.

In the next section, the author proposes a distance education research framework considering the preceding discussion.

Figure 4: Proposed distance education research framework



Distance education research should be contextualised in the pedagogical and technological developments in distance education. The pedagogical developments allow researchers to understand distance education delivery from the first generation to the current generation. The dominant pedagogical theories in the different distance education generations afford the researcher to understand the new online learning theories and appreciate the contributions of the classical learning theories to online learning. Research in distance education also needs to be wary of the technological developments from the print technology of the first generation to the emerging and emergent digital technology of the current generation. The focus areas upon which distance education research is carried out should be understood from broader issues to more specific micro issues. Such an understanding provides a holistic understanding of distance education research issues. The current online learning theories should serve as theoretical underpinnings to guide distance education research in online environments. It is also time to embrace methodological plurality in understanding distance education research. Where possible different research methods

and approaches should be combined in a single study to provide a full understanding of the issues under investigation. The need for meta-research is equally important. There is a need for research on distance education research as well as the assessment of the impact of distance education research on distance education provisioning.

Conclusions and recommendations

Distance education is a growing field, and it continues to grow. Distance education research is at the heart of the development of distance education practices. There is, therefore, a need for systematic and sustained distance education research, especially in the developing contexts.

The following recommendations are made:

a) There is a need to develop a critical mass of distance education researchers in developing contexts. This is possible by training and supporting budding researchers to consider distance education as a research field. There should be deliberate training programmes in distance education institutions where students at the postgraduate level and lecturers at the early career level take distance education research seriously.

b) Distance education institutions should employ distance education research champions whose mandate it is to popularise and advance distance education research. The research champions may be involved in training and mentoring junior researchers in the different aspects of distance education research and publication.

c) There should be deliberate efforts to incentivise research in distance education by encouraging postgraduate studies, conference presentations, and publications in the different areas of distance education.

d) The institutionalisation of local symposia and conferences in individual distance education institutions is important in developing a culture of scholarly exchange, debates, and reflection on the different facets of distance education.

e) The concept of research in practice should be encouraged among distance education practitioners, as meaningful research is generated through action research and practitioners seek solutions to address challenges in distance education practice.

References

Adanir, G.A. 2021. Assessment types and methods in distance learning. In: *Handbook of research on determining the reliability of online assessment and distance learning*, edited by A.S. Moura, P. Reis and M.N.D. Cordeiro. Hershey, PA: IGI Global. pp. 24–42.

Ahmad, T. 2020. Student perceptions of using cell phones as learning tools: Implications for mobile technology usage in Caribbean higher education institutions. *PSU Research Review*, 4(1): 25–43. Available at: https://doi.org/10.1108/PRR-03-2018-0007

Alevizou, G. 2015. From OER to MOOCs: Critical perspectives on the historical mediation trajectories of open education. *International Journal of Media and Cultural Politics*, 11(2): 203–224. Available at: https://doi.org/10.1386/macp.11.2.203_1

Ally, M. 2008. Foundations of educational theory for online learning. In: *The theory and practice of online learning*, edited by T. Anderson. 2nd ed. Edmonton: Athabasca University Press. pp. 15–44.

Amin, A.A. and Ntembe, A. 2021. Sub-Sahara Africa's higher education: financing, growth, and employment. *International Journal of Higher Education*, 10(1): 14–23. Available at: https://eric.ed.gov/?id=EJ1285616

Anderson, L. and Krathwohl, D. (eds). 2001. *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York, NY: Longman.

Anderson, T. and Dron, J. 2011. Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning*, 12(3): 80–97. Available at: https://doi.org/10.19173/irrodl.v12i3.890

Archambault, L., Leary, L., and Rice, K. 2022. Pillars of online pedagogy: A framework for teaching in online learning environments. *Educational Psychologist*, 57(3): 178–191. Available at: https://doi.org/10.1080/00461520.2022.2051513

Bates, A.W. 2015. *Teaching in a digital age*. Vancouver: AU Press.

Brigance, S.K. 2011. Leadership in online learning in higher education: Why IDs for online learning should lead the way. *Performance Improvement*, 50(10): 43–48. Available at: https://doi.org/10.1002/pfi.20262

Bush, G. 2006. Learning about learning: from theories to trends. *Teacher Librarian*, 34(2): 14–19.

Carruth, P.J. and Carruth, A.K. 2013. Educational and financial impact of technology on workforce development. *American Journal of Business Education*, 6(5): 513–520. Available at: https://doi.org/10.19030/ajbe.v6i5.8041

Chávez, J., Montaño, R., Barrera, R., Sánchez, J., and Faure, J. 2021. Quality of online learning participation in a context of crisis. *Higher Learning Research Communications*, 11: 72–87. Available at: https://doi.org/10.18870/hlrc.v11i0.1203

Chen, I. 2011. Behaviorism and developments in instructional design and technology. In: *Instructional design: concepts, methodologies, tools and applications*, Information Resources Management Association. Hershey, PA: Information Science Reference. pp. 1259–1281.

Conrad, D. and Openo, J. 2018. *Assessment strategies for online learning: engagement and authenticity*. Edmonton, AB: AU Press.

Croft, N., Dalton, A., and Grant, M. 2015. Overcoming isolation in distance learning: Building a learning community through time and space. *Journal of Education in the Built Environment*, 5(1): 27–64. Available at: https://doi.org/10.11120/jebe.2010.05010027

Dlamini, R. and Ndzinisa, N. 2020. Universities trailing behind: Unquestioned epistemological foundations constraining the transition to online instructional delivery and learning. *South African Journal of Higher Education*, 34(6): 52–64.

Ertmer, P.A. and Newby, T.J. 2013. Behaviorism, cognitivism, constructivism: comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 26(2): 43–71. Available at: https://doi.org/10.1002/piq.21143

Gaba, A.K. and Dash, N.K. 2004. Course evaluation in open and distance learning: A case study from Indira Gandhi National Open University. *Open Learning*, 19(2): 213–221. Available at: https://doi.org/10.1080/0268051042000224806

Gergen, K.J. 1995. Social construction and the educational process. In: *Constructivism in education,* edited by L.P. Steffe and J. Gale. Hillsdale, NJ: Lawrence Erlbaum Associates. pp. 17–40.

Harasim, L. 2012. *Learning theory and online technologies*. London: Taylor& Francis.

Herodotou, C., Sharples, M., Gaved, M., Kukulska-Hulme, A., Rienties, B., Scanlon, E., and Whitelock, D. 2019. Innovative pedagogies of the future: an evidence-based selection. *Frontiers in Education*, 4(113): 1–14. Available at: https://doi.org/10.3389/feduc.2019.00113

Iqbal, J., Mahmood, E., and Idrees, M. 2019. Effectiveness of self-instructional material of distance education. *Pakistan Journal of Distance & Online Learning*, 5(1): 71–90. Available at: https://pjdol.aiou.edu.pk/?p=928

Kuruppuarachchi, K.A.J.M. and Karunanayake, K.O.L.C. 2017. Student characteristics and knowledge on ODL concepts at first registration: A case study from OUSL. *Asian Association of Open Universities Journal*, 12(1): 41–51. Available at: https://doi.org/10.1108/AAOUJ-11-2016-0004

Maphosa, C. and Bhebhe, S. 2020. Interrogating the concept 'openness' in open distance learning (ODL). *European Journal of Open Education and e-Learning Studies*, 5(2): 16–29. Available at: http://dx.doi.org/10.46827/ejoe.v5i2.3282

Mogaji, E. and Jain, V. 2020. *Impact of the pandemic on higher education in emerging countries: emerging opportunities, challenges and research agenda*. Research Agenda Working Papers. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3622592

Papadopoulou, A. and Palaigeorgiou, G. 2016. *Interactive video, tablets and self-paced learning in the classroom: preservice teachers' perceptions*. Paper presented at the International Association for Development of the Information Society International 13th International Conference on Cognition and Exploratory Learning in the Digital Age (CELDA), 28-30 October, Mannheim, Germany. Available at: https://eric.ed.gov/?id=ED571422

Razali, S.N., Ahmad, M.H., and Noor, H.A.M. 2020. Implications of learning interaction in online project-based collaborative learning. *Journal of Computational and Theoretical Nanoscience*, 17: 681–688. Available at: https://doi.org/10.1166/jctn.2020.8831

Reguera, E.A.M. and Lopez, M. 2021. Using a digital whiteboard for student engagement in distance education. *Computers and Electrical Engineering*, 93: 1–6. Available at: https://doi.org/10.1016/j.compeleceng.2021.107268

Sharma, H., Jain, V., and Mogaji, E. 2020. Defining developing countries in the higher education context. *Research Agenda Working Papers*, 1: 1–9. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3774632

Siemens, G. 2005. Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1): 3–10. Available at: http://www.itdl.org/Journal/Jan_05/article01.htm

Siemens, G. and Downes, S. 2009. Connectivism and connective knowledge. *International Journal of Instructional Technology and Distance Learning*, 2(1): 3–10.

Srichanyachon, N. 2014. EFL learners' perceptions of using LMS. *Turkish Online Journal of Educational Technology-TOJET*, 13(4): 30–35. Available at: http://tojet.net/articles/v13i4/1344.pdf

Stewart, W.H. and Lowenthal, P.R. 2022. Distance education under duress: A case study of

exchange students' experience with online learning during the COVID-19 pandemic in the Republic of Korea. *Journal of Research on Technology in Education*, 54: 273–287. Available at: https://doi.org/10.1080/15391523.2021.1891996

Taylor, J.C. 2001. Fifth generation distance education. *Instructional Science and Technology*, 4(1): 1-14. Available at: http://www.usq.edu.au/e-jist/

Van Wart, M., Ni, A., Medina, P., Canelon, J., Kordrostami, M., Zhang, J., and Liu, Y. 2020. Integrating students' perspectives about online learning: A hierarchy of factors. *International Journal of Educational Technology in Higher Education*, 17(53): 1–12. Available at: http://www.c3l.uni-oldenburg.de/cde/media/readings/taylor01.pdf

Verawardina, U., Asnur, L., Lubis, A.L., Hendriyani, Y., Ramadhani, D., Dewi, I.P., and Sriwahyuni, T. 2020. Reviewing online learning facing the Covid-19 outbreak: Impact of interactivity, and the mediating role of imagery, presence, and flow. *Information & Management*, 53: 504–516.

Vygotsky, L.S. 1978. *Mind in society: the development of higher psychological processes*. Cambridge: Harvard University Press.

Wollscheid, S., Stensaker, B., and Bugge, M.M. 2019. Evidence-informed policy and practice in the field of education: The dilemmas related to organisational design. *European Education*, 51(4): 270–290. Available at: https://doi.org/10.1080/10564934.2019.1619465

Zawacki-Richter, O., Bäcker, E.M., and Vogt, S. 2009. Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *International Review of Research in Open & Distance Learning,* 10(6): 21–50. Available at: https://www.irrodl.org/index.php/irrodl/article/view/741/1461