Chapter 24:

Conclusion: Quo Vadis – Stock Taking and Reflections on Researching Open, Distance, and Digital Education

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The foundations

Open, distance, and digital education (ODDE) has a long history, and therefore it is essential to gloss through the past to be able to appropriately locate research in this field. Starting from the earlier form of correspondence education in the nineteenth century, distance education has passed through significant phases of debates and discourses on its identity, as an academic discipline, and its research contours and trajectories. The early stalwarts for its theorisation included Charles Wedemeyer and Borje Holmberg to be joined subsequently by Otto Peters, Michael Moore, and Desmond Keegan. Moore's (1976) theory of transactional distance appeared subsequently, though it was Holmberg (1985) who provided the first structural classification of distance education literature. It was only in 1982 that the International Council for Correspondence Education (ICCE) was renamed as International Council for Distance Education (ICDE), which signalled the changing nature of correspondence—distance education. In 1985 Moore (1985) undertook the first research literature review which suggested a poor condition, and subsequently remarked that DE should have an empirical base of research (Moore 1988). An expanded version of research perspectives on distance education was brought out by Holmberg (1990) at the German Zentrales Institut fur Fernstudientorschun(ZIFF).

In 1994 Michael Young, while delivering the foundation address at United Kingdom Open University's (UKOU) twenty-fifth anniversary, underlined: 'Discourse, dialogue, discussion, research are essential to all academic progress but with open learning a very special effort needs to be made to foster research into open learning itself' (quoted in Perraton 1999: page number needed). Otto Peters, the founding rector of FernUniversität and who theorised DE as an industrialised system of education, at a special lecture at the ICDE conference in 1999 had remarked that universities need

to be student-oriented, practice-oriented, and future-oriented, and put research and development (R&D) at the forefront of institutional development (Peters 1999). Subsequently, Terry Evans, who has been a critical thinker and researcher of DE, had commented that open universities needed to take the issue of research seriously if they were to be seen as universities (Evans, 2000). Thus, the foundation to research in DE was already laid.

The publication on the generations of distance education by Taylor (1995) further triggered research on DE along with associated technologies. Meanwhile, two conceptual frameworks for distance education research appeared—one by Calvert (1986) on input-process-outcome and the other by Panda (1992) on input-process-output. In 2000 an international conference on research in adult and distance learning in Hong Kong (Panda 2000) led to deliberations on developing a systematic DE research literature, methodologies, and causes which subsequently resulted at the Commonwealth of Learning in the form of 'practitioner research and evaluation skills training in open and distance learning' (PREST; COL 2004) which developed specific ODL research literature on seven areas by international experts. Subsequent frameworks, as discussed below, appeared, and the twenty-first century has seen significant progress in this field.

Review of research so far

Systematic review of research on ODDE discussed below is based on the reviews that are based on either studies conducted at pan-national levels and/or papers published in a single refereed journal over a period of time. While Jegede (1994) classified research studies into eight areas for the *Australian Journal Distance Education;* Koble and Bunker (1997) classified research studies published in the *American Journal of Distance Education (AJDE)* into seven areas; Berge and Mrozowski (2001) categorised research studies into ten areas in the *AJDE*; Rourke and Szabo (2002) into nine areas for the *Canadian Journal of Distance Education*; and Lee, Driscoll, and Nelson (2004) into six areas for the *AJDE*.

An early comprehensive analysis of distance education research literature and research studies was undertaken by Mishra (1998) in which there was detailed analysis of the structure of distance education research literature, conceptual frameworks of research, methodological issues, priority areas of research, a case for institutional research in distance education (Panda 1995), collaboration in research and development (Koul 1993), and ethical issues in distance education research (Evans and Jakupec 1996).

Systematic reviews of research on ODDE undertaken in this century point to completion of significant work and also the research trends for the future. Zawacki-Richter's (2009) classification of ODDE operation at macro, meso, and micro levels has been an often-quoted framework for system functionality and management and also for classifying research studies. This was the first Delphi study on distance education research, and the author's classification of research into *macro* level (access and equity, theories and models, globalisation and cross-cultural studies, systems and institutions, and research methods), *meso* level (innovation and change, quality assurance, costs and benefits, professional development and support, learner support, educational technology, management and organisation), and *micro* level (instruction and communication, instructional design, and learner characteristics) has been a well-established framework for the practice of distance education (the framework of which has also been carried forward by the author in the development of the latest international handbook of open, distance, and digital education by Zawacki-Richter and Jung 2022). The author points out that there had been a significant shift from technology-centred research to institutional management and change (an issue which shall be reinforced later in this chapter). This is more desirable since research on strategic planning and management (Panda 2003, 2008) and on cost-effectiveness and cost-efficiency (Rumble 1997; Bramble and Panda 2008) has been wanting and therefore deserve more attention especially in the present context of globalisation, technologisation, and open educational practices. Besides, Zawacki-Richter also suggested prioritisation in areas relating to faculty development/capacity building, and pedagogical impact of educational technologies on teaching-learning, and of social technologies and networks on collaboration and interaction. The review conducted by Zawacki-Richter, Backer, and Vogt (2009) on research areas, methods, and patterns of authorship will also be useful to many. A subsequent Delphi study on various distance education stakeholders in the United States by Rice (2009) yielded nine years of research and research priorities: evaluation of course design and delivery, best practices, accountability, access, online learning and learners, professional development, accreditation/standards, funding, and technology.

In a review of research in selected chapters of the second edition of the handbook on DE edited by Michael Moore, West (2011) analysed studies on learners (independent learning, student satisfaction), learning (cognitive perspectives, group development), and learner support (supporting female and disabled students, academic advising, and academic libraries), and also raised research questions related to: impact of socially interactive modes of technology on meta-cognitive strategies, course design to foster self-regulated learning and meta-cognition, impact of distance learning on intrinsic cognitive load, assessment strategies promoting group-based

learning, student satisfaction vis-a-vis learning environment, and synchronous versus asynchronous communication. The author further underlined the need for large scale national surveys toward formulation of institutional policies and practices.

Two research review studies by Bozkurt et al. (2015a on journal content analysis, 2015b on dissertation analysis in Turkey) draw our attention. In the former, the authors specially analysed the theoretical frameworks and methodologies adopted by various researchers besides general characteristics of age and gender, cognitive processing, learning strategies and cultural differences, learning in informal and non-formal learning environments, and use of multiple research designs and models. The Turkish DE research review draws our attention to the lack of theoretical/conceptual frameworks of research which needs to be emphasised, along with the use of more mixed methods design and multiple research models in the quantitative, qualitative, and mixed methods studies.

In a comprehensive mapping of research trends in 515 articles published in the high impact journal *Distance Education* for the past 35 years, Zawacki-Richter and Naidu (2016) discerned five-yearly trends in six thematic areas: professionalisation and institutional consolidation during 1980–84, educational technology and instructional design during 1985–89, quality assurance during 1990–94, learner support and early stages of online learning during 1995–99, virtual university during 2000–2004, online interaction and collaborative learning during 2005–09, and MOOCs and OER during 2010–2014. While institutional research was at the meso level, individual research focused on the micro level. The authors underlined that online educational technologies are poised to guide the future of DE.

A few more useful research reviews appeared during the pre-Covid era. In the review by Orellana and Nethi (2019), more than half of the research studies was on teaching-learning (at micro level), followed by management and technology (at meso level), and systems and theories (at macro level). In another review of 500 most-cited articles, it was found that most of the articles were from the United States and the UK (Amoozegar et al. 2018). Park and Shea's (2020) co-citation analysis underlined earlier focus on asynchronous discussions, was followed in the later decade by learner satisfaction and self-regulation. The authors suggest for future researchers to focus on learner characteristics; interaction between students, teachers, content, and assessment; and conducting cluster analysis with supplementary analysis to make such reviews more comprehensive.

During the past decade, technology has dominated ODDE, so also research in this field. The research trend analysis by Cakiroglu et al. (2019) shows that the past decade focused more on MOOCs and OER, though some attempts had already been made to link online learning to pedagogic designs. Similar findings were reported by Valverde-Berrocoso et al. (2020) in addition

to the use of the community of inquiry model, technology acceptance model, and case study approach. A deeper first-order and second-order meta-analysis was carried out by Martin et al. (2022) who reported influence of the generation level of distance education and instructional setting on cognitive, affective, and behavioural outcomes for ODDE students in comparison to face-to-face learning, and that was more so in the case of higher education.

In a recent systematic review of research on online learning, Martin et al. (2023) classified online learning research reviews within a system-pedagogy-people framework. The three strands included:

1. System: Concerns relating to provision and quality
2. Pedagogy: Concerns relating to collaboration, engagement, assessment
3. People: Concerns relating to moderators/mentors and mentor competences

The reviewers point out that early research on Online Learning (OLL) focused on learning communities, discussion forum moderation, interaction, and team teaching, which subsequently included research on blended learning. Leading up to 2020, Covid-19 extended the use of OLL all over the globe, though most of it was construed as emergency remote teaching/learning (Hodges et al. 2020). Subsequent research at the 'systems' level focused more on course design and technology, teachers and instructors, and learner engagement. The pandemic added newer variables of parental engagement, and institutional and individual adaptation to online learning, and impacted the shift from the obsession with learner engagement to online course development and technology, and additional training of online instructors/teachers. From a systems perspective, more research is needed on: flexibility in course design and delivery, multiple modes of communication between teachers and students, and multiple assessment strategies. An additional area of research could focus on teacher burnout, additional complementary sources of learner support, and continuing professional development and training of online teachers. With respect to the 'pedagogical' stance, more research was suggested on areas of anxiety and time management, generalisable studies on help-seeking strategies, inter-subjectivity in discussion-based (asynchronous) learning, pedagogical strategies for passive participation, and goal setting and online assessment. The suggestive areas in respect of the 'people' strand included: course design and students-teachers as autonomous agents, moderation in asynchronous online discussions, and instructor/teacher competencies.

Research studies and research reviews on ODDE during Covid-19 have been published in many parts of the globe. In a review with the application of data mining and data analysis, Bozkurt

(2022) identified three themes: (i) resilience, adaptability, and sustainability; (ii) uncertainty and stress/well-being: and (iii) rising use of online distance education and hybrid learning. The author points out that the future of higher education will depend on national and institutional skills of adaptability and sustainability. In a recent review of 191 peer-reviewed journal papers, Boo et al. (2023) underlined that all TEL during the Covid-19 period may not be termed as 'emergency remote teaching'. Within an online learning research framework of 'organisation-course and instructor-learner' as stakeholders of online learning, the authors pointed out that of the 619 papers published during 2009–2018, almost 56 per cent were on learners, 30 per cent on courses and instructors, and 14 per cent on organisations. While blended learning had been researched in the past, more emphasis is required in respect of: (i) hybridisation of learning; (ii) cost reduction in resource development if one goes online; and (iii) mental health and well-being of various players (learners, teachers, instructional designers, and programme administrators). The lowest researched area, and which needs more attention, was characteristics of online instructors and learner-learner engagement. Further, Covid-19 has created a situation where all teachers needed capacity building/professional development on online learning, to either go for blended/hybrid teaching-learning or even exclusive online learning. A related area of research has been how teachers and students use educational and learning technologies for personalised and collaborative learning. In a recent review of literature/research in the past twenty years, Lu et al. (2022) used the PRISMA method, and suggested that more research is needed, besides technological usability, on pedagogical (that is, cognitive, meta-cognitive, and neurological) and socio-cultural aspects of usability, and supporting learners to achieve their learning goals.

An analysis of research trends in DOL during Covid-19 by Mishra et al (2021) suggests extensive focus on higher education and remote teaching-learning including technology-enabled learner support, though very few research studies focused on workplace training and lifelong learning (an area which warrants more focus in the future).

In an ongoing-Covid research trends analysis, Zawacki-Richter and Bozkurt (2022: 18) underlined: 'Even though the trigger from the COVID-19 pandemic is horrific, the future of ODDE looks bright and promising. In light of this development, it is important to build upon the theory, research, and practice in ODDE to prevent that the wheel is reinvented."

Technology and learning: AI, ML, DL, learning analytics

In the past few years, new technological developments have been applied to education and ODDE. It was observed that ODDE research literature has focused considerably on artificial intelligence (AI) and related variables, and therefore these require further examination. In the context of artificial intelligence (AI) in education/learning, it is important to further examine machine learning (ML) within which deep learning (DL) is located. The earliest classification of surface learning and deep learning by Marton and Saljo (1976) has further been extended to higher order cognitive processing (Fullan et al. 2017), which is interdisciplinary and collaborative and focuses on student engagement in meaningful activities and real-world problems. Pedagogy, involving deep learning, has focused on student self-regulated learning (for example, see Zhao et al. 2014 in the context of ODL) and formative assessment which technology can facilitate to empower learners to understand their current achievements and the requirements of their future learning. Understanding learner engagement in deep learning and the processes involved in learning as transformation assumes importance, as also how meaningful feedback can address both cognitive and affective needs of students (Webb et al. 2021) and facilitate teachers and students to work together in order to recognise and record evidence of their achievement of learning outcomes.

We need to understand the relationship between human deep learning and machine deep learning, as also between computer science and neuroscience. One significant goal of using ML for students is that they may, in the process, appreciate more about their own cognitive processes, self-regulated learning, and meta-cognition. Webb et al. (2021) in their critical analysis suggested for researchers and educators to focus on mechanisms for explainability and accountability, as also for risk analysis, code of conduct, control, and legislation for ML in education.

Learning analytics (LA) has attracted the imagination of both learning designers and researchers of TEL since its inception in 2011. This is evidenced more in the context of open, distance, and digital education. LA provides for collection, analysis, and reporting data on learners and learning contexts for understanding and making decisions on optimisation of the learning environment, as also learning. A significant number of learning theories are related to learning analytics, and the goal is to facilitate both the designers/teachers to have greater insight into how students learn, as also the learners to get insight into their preparedness for future learning. While distinguishing between data analytics and learning analytics, Khalil et al. (2022: 16) underlined that: 'With increasing access to bigger data sets; a greater variety, granularity and velocity of data; the increasing use and performance of multimodal learning analytics; and the potential and risks of Artificial Intelligence

and Machine Learning, we caution against approaches that devalue theory.' While theoretical positions will vary, as well as research designs and processes based on a particular theoretical position, it is important that either multi-theoretical perspectives are considered in the context of learning analytics or each research analysis with one theoretical perspective is retested along with another. Since knowledge has boundaries and each discipline has disciplinary knowledge practices, it is important to draw upon multiple theories especially in complex environments. Paradigmatic, theoretical, and methodological diversity and pluralism is a challenge to the researchers, and this will remain a long-standing area for the researchers of open, distance, and digital education.

In extension of these, Prinsloo (2022) underlined the following research questions/areas for further investigation:

- How does LA research build on existing theory?
- What does LA research contribute to theory?
- What are the practical effects of LA?
- What is the student role in LA?

In a recent review and Delphi-based study, Ifenthaler et al. (2021) suggested that research questions on learning analytics should consider four needs:

- knowledge to select and use analytics for learning-focused decision making
- guiding principles and policies for institutional practices that enhance learning
- standards for ethical use of learning analytics
- flexible, user-friendly analyses focused on enhancing learning

In respect of AI and related technologies as discussed above, some pertinent and critical questions have been raised by Selwyn (2022) in respect of its application in education and ODDE, and which need to be researched further. The first issue concerns the future of AI which is uncertain and unpredictable; there is a possibility for AI to increase the dehumanisation of education and teaching-learning. There is more of 'heightened rhetoric and extravagant promotion' (Selwyn 2022: 621) and marketing by the vendors. Instead, the focus should be on the processes of machine learning and algorithmic training for each type of technology, and the 'actual computational, material and meta-physical limits' (Selwyn 2022: 622) of this technology. Second, we need to go beyond the information-processing model to consider if AI can address the social lives of people embodied

with emotions, common-sense, and irrational thoughts. This is also true for social comprehension, which is contextually bounded and which encompasses reasoning, imagination, reflection, empathy, morality, and aesthetics. The third concern is in respect of social harmfulness of AI, and if it can address the social reality of inequality, racism, and social discrimination. The fourth concern relates to 'technical fineness versus social desirability' (Is this a direct quote from a source?). Birhane and Guest (2020) underlined the influence of behavioural psychology and neuroscience on AI as socially hazardous, since the former have historically been branded as sexist and racist. Therefore, research on AI in education/ODDE must be geared toward not only problem-solving per se, but more importantly problem-solving in socio-cultural contexts, dismantling injustice, inequality, and pre-set agendas and ideologies. AI research should also take note of the concern if AI and data analytics support good teaching as a combination of art, skill, and experience of teachers (Gillard 2021). Fifth, AI, like any other technology-driven application, needs to consider the environmental and ecological hazards that it creates, align with green-tech principles, and contribute to ecologically sustainable growth. It may be desirable to align educational AI with the principles of green-tech. Finally, especially in ODDE where there is extensive use of user data, application of AI needs to guard against any centralisation of power and serving the dominant voices. These concerns may be further explored by the researchers of ODDE in particular.

Educational technology and digital education

Educational technology has been at the heart of open, distance, and digital education, starting from the use of audio-visual aids and print technology to the developments in the semantic and symbiotic web and web 4.1 and new developments in artificial intelligence and machine/deep learning (Panda 1990, 2009; Siemens 2005; Salmon 2019). While significant research has been conducted on this area (and while most of the ODDE journals are surprisingly dominated by research topics on this area at the cost of other relevant areas of research), fundamental questions have been raised by scholars on the nature and intention of technology per se and educational technology in particular. In respect of technology being construed as instrumentation and guided pedagogy, Lovat (2019: 11) underlines the misuse of technology: 'In a word, instrumentalist pedagogy survives as a tool of political agendas and populist media, whereas values pedagogy rests on the firmest evidence from philosophical and neuroscientific research about how the mind works, the brain functions and how efficacious learning is therefore best effected.'

Neil Selwyn has been very critical of this issue in his scholarly analysis and arguments, including the debate on 'education versus learning'. While underlining that use of digital technology in education is a matter of ongoing debate, he cautions that 'It is therefore important to see digital technology use in education as a matter of values, preferences and politics' (Selwyn 2016: 107). In a recent editorial, the author and colleagues put up a research agenda in which the practitioners and researchers need to be critical in the theorisation and investigation of the link between technology, socio-economic inequality, and the provision of education (Selwyn et al. 2020). Further, the EdTech research should go beyond the theoretical and methodological approaches used in educational research to interdisciplinary areas of critical data studies, anticipatory studies, and critical design which is a disciplinary mix of computational sciences and social sciences.

EdTech research in ODDE should seriously consider, and take up for further investigation, what Selwyn (2023) critically reflects as being aspects of digital technology which are potentially more harmful and may contribute to widening educational inequalities. However, EdTech provisions may be formulated such that they contribute to 'communally defined goods and social justices' (Selwyn 2023: 3). Instead of individual consumption-based formulation, this should be treated as a collective-community-common opportunity. Voices have been raised in respect of decolonisation of educational technology, feminist approaches to technology, and technology for equality (that is, which does not perpetuate inequality). A pertinent suggestion has been that educational technology and tools have to be such that the users—that is, teachers and students—can understand, manage, and control on their own, rather than by any pre-determined or pre-set programme or pathway. More research is needed to discern the goals and processes of teacher and student interdependent autonomy in any technology-pedagogy-learning design formulation. That is, how can educational technology facilitate freedom, creativity, innovation, and common good?

In the context of mainstreaming TEL, Panda and Mishra (2020) reviewed the works undertaken in the Commonwealth and underlined some research agendas for the future. The authors brought in some relevant and significant suggestions made by some authorities in the field—namely, as follows: (i) to go beyond the concerns of provisions and mechanisms to understand how technology facilitates teaching and learning (Kirkwood and Price 2013); (ii) a community of practice framework for research on TEL in social and situated contexts (Smith et al. 2017); (iii) exploring pedagogic models including those of constructivism, connectivism, and network theories for technologies in making learning more engaging, meaningful, and productive (Panda and Mishra 2020); (iv) learning design in an open world (Conole 2013); and (v) a comprehensive framework of TEL and its relationship with policy contexts across nations (Han et al. 2018). Related to this, a recent

review and background paper commissioned for UNESCO may be useful to reflect on some more pertinent research questions (Burns 2021).

This book

The present book *Researching distance education in the developing context: Building proactive into theory* edited by Aluko and Coetzee, assumes greater significance especially when research and research-informed practice is low in the Global South (in comparison to the Global North), and especially when the research frameworks and ODDE models of the Global North are often blindly followed in the South. The editors have also clearly underlined the goal—that is, to build research into practice, and that research should contribute to improving theory, practice, and policy. The twenty chapters arranged under six thematic areas cover almost all aspects of ODDE—history and philosophy, global trends and gaps, regional trends and gaps, theory into practice, and quality. One important theme addressed in the book concerns research publications with sound theoretical/conceptual frameworks and ODDE models. It may be underlined that publication outlets in the Global South are restricted and referred journals in the North have moved more towards open publishing (which is largely paid publishing). Both of these trends restrict research and publications in the South. I recall conducting a series of research publication workshops at UNISA by Fred Lockwood and myself with the objective of facilitating the faculty to use the rich data at hand to achieve the goal of publication in referred and high impact journals. South Africa itself publishes world-class refereed journals in education (which include research papers on ODDE, though limited in number). It is therefore intended that this book and all its chapters could contribute to the development of a research and publication/dissemination culture and mindset, which should also contribute to enhancing the quality of (distance) education and especially the quality of student learning experiences, including employability skills.

In the South African context, two earlier reviews are also useful (Roberts 2016; Roberts and Van der Walt 2021). Within the framework developed by Zawacki-Richter (2009), Roberts (2016) reported the percentage of studies at the three levels: micro level (above 67 per cent), meso level (up to 30 per cent), and macro level (only 3 per cent). The dominant research areas fell under the micro level: instructional design, learners, and interaction. Access to technology and broadband, as well as digital literacy had been the major hurdles for online learning. The 2021 review (Roberts and Van der Walt 2021), which was more extensive, covering the decade of 2010—2019, yielded

similar findings; the priorities in rank order included: instructional design, learner characteristics, interaction and communication, professional development and faculty support, learner support services, and ten more areas. The authors reinforce the echoes from other parts of the globe—that proliferation of micro-level research has restricted publication in international journals, and that teachers and researchers require more context-specific ODL research frameworks in their research investigations.

In conclusion: further reflections

Keeping in view the goals set by the book editors, the organisation of the thematic sections and chapters, and based on the review analysis undertaken in the preceding sections of this chapter, ODDE research is reflected further under a few relevant thematic areas as discussed below.

The field itself

In the past, correspondence education, distance education, open education, and online learning remained distinct fields and systems with defined processes. With the emergent concept and process of 'blended learning' (the separate identity of flipped classroom practices notwithstanding), the claim to distance/online teaching-learning has somehow been diluted. Each country, though, has distinct regulations specific to this system and educational delivery strategies. The problem of dilution creeps in when research studies are undertaken. In an authoritative work, Bernard et al. (2004), while reviewing 232 studies published between 1985—2002, excluded about 300 studies in which DE was only a supplement to the main F2F instruction.

The debates of the past decades on distance education as a distinct area of study, as also a distinct discipline, will continue for the future, though more focused attention of researchers is required for discerning the nature and processes of blended learning, course design, student engagement and learning, strategies of scaffolding, equivalency, credit accumulation, and transfer and recognition of prior learning (especially for on-the-job training, vocational education and training, and lifelong learning). While blending is always welcome, caution needs to be exercised in research themes/problems and research publications to care for maintaining ODDE as a distinct (though interdisciplinary) area of work, research, and publication.

Further research: priorities and possibilities

Many research areas and research questions raised already in the foregoing review of research should draw the attention of the readers and researchers. These are consolidated below with additional research evidence and priorities.

The research trend analysis on 27 735 articles published during 2008—2018 through text-mining and semantic content analysis by Gurcan and Cagiltay (2020) indicates the thematic areas covered and on which further research is required as follows: system, content, method, media, learner, interaction-communication, and resources-materials-tools. This is a framework which could possibly guide future researchers.

Suggestions on future research areas given by Bernard et al. (2004) still hold good today: development of theoretical frameworks for DE design and analysis; student satisfaction studies which should go beyond 'flexible convenience of study' (is this a direct quote from a source?) to include student perseverance, persistence, and choice of tasks; teacher competencies (effective use of media, effective and appropriate application of classroom teaching skills to DE, collaborative learning, and constructivist teaching-learning); student higher order meta-cognitive learning; inclusivity and accessibility for isolated and disadvantaged learners; and pedagogic features for media types (including effectiveness of media that support teaching and that support learning).

As the analysis of reviews presented above suggests, technology has the most dominant influence on ODDE, so also on research studies on this area. Martin et al.'s (2020) analysis with 619 articles on broader research themes on online learning revealed decreasing numbers during 2015—2016 while the theme has again picked up and dominated during 2017—18 and thereafter. The suggestions given by the authors are indicative of future research possibilities: (i) examination of variables like access, equity, inclusion, culture, and ethics in the context of online learning with diverse learners; and (ii) at the organisational level, examination of leadership, policy, and management which goes beyond faculty accountability to focus on leadership and management accountability. Though not overtly and extensively researched, researching this area requires institutional policy and support, which could also suggest how and to what extent institutional decision making is based on research (Paul 2017; Shale 2017). The authors underlined that costs and benefits which are subsumed within the aspects of organisation and management need more research attention, so also institutional and learner support. Management, organisation, leadership, and costs (including return on investment) will require more attention in the future. This also suggests more institutional research at macro and meso levels.

With the widespread use of social technologies and networks, research questions have been raised in respect of the effect of such technologies and network-based learner support on student independent, self-regulated learning and self-directed learning and also student collaborative reflection and learning (Panda 2022). The focused research questions included: the relation between interaction and tutoring with student behaviour, needs, motivations, and study approaches; the impact of course design and support on student study, dropout, and success; the effect of support and scaffolding strategies on interaction, self-review, peer mentoring, reflection, and confidence building; contribution of AI, IoT, ML, and LA to institutional administrative-academic-support 'system' and to cost-effectiveness and cost-efficiency; and changing teacher competencies in the changing context of open educational practices. This also includes student self-regulated learning and meta-cognition, and competencies to combine academic knowledge, skills developed through micro-credentials (Panda 2022b), social and life skills, and future skills (Ehlers 2022).

Student engagement in learning activities and discussions significantly contributes to student reflection and quality of learning experiences. Martin et al. (2020) suggest that while it is important to further investigate what engagement entails, it also needs further investigation on the nuances and effects of online engagement and teacher scaffolding, and the relation between learner characteristics and engagement on the one hand and course design on the other hand.

Furthermore, Zawacki-Richter and Latchem's (2018) analysis of research on ICT (from computer-based instruction to online learning) and Mishra's (2019) analysis of research on learning for development (specially the context of education, teachers and teaching, and student learning) could provide further impetus to our future formulation of research agendas.

Looking at the dominance of current research publications on TEL, one is amazed and sometimes disappointed to see a skewed and biased trend. Technology of course has been an important driver to the expansion of ODDE globally, however, the foundational aspects of pedagogy, teacher attitude and competency (and characteristics), learning resources and learning design, learners, the institution, and organisation and management need to be put at the forefront of research and engagement vis-a-vis technology. This also subsumes consideration of the limitations of past research on educational and learning technologies and focus more on the 'pedagogical and socio-cultural aspects' of usability studies with due consideration to conceptual frameworks, evaluation methods, and usability methods (Lu et al. 2022). While research on AI-ML-DL-LA should address the issues raised in an earlier section, research on TEL should also consider investigating technology, ODDE and socioeconomic inequality, and student self-efficacy (vis-à-vis justice and power); as also how teachers and students understand, manage, and control technology on their own for self and collaborative learning.

The interaction between gender and ODDE is still an evolving area of research (Von Prummer 2000; Zawacki-Richter and Von Prummer 2010), and the recent work by Aneja (2020) may be another addition to the research literature to bank upon.

Teacher capacity building vis-à-vis teacher attitude, competencies, choice of course/learning design models, and assessment rubrics/strategies still remain an under-researched area, especially in the context of blended/hybrid learning, diversified models of course design and delivery (in respect of time, cost, constraints, and quality), and the current open educational practices.

The traditional model of course design, learning resources, and traditional learner support mechanisms with support extended by technology remains at the heart of ODDE in the Global South. All the macro and meso variables within this traditional framework need further investigation to facilitate development of ODL institutions, empower their teachers, and enhance the quality of their student learning.

It is time now to balance the micro versus macro-meso by emphasising more on access and equity, ODDE systems and operations, management and costs, continuing professional development, support, and quality assurance. It is also time to revisit and recycle the individual-institutional research perspectives (Zawacki-Richter and Bozkurt 2022: 15) to re-emphasise the system, the organisation, the support, and the professional development. As underlined long back by Robinson (1995), research on ODL should focus more on theory building and also systematically build on the existing research.

Research design and research publishing

While most reviews of research on ODDE have pointed out the poor (or near absence of) theoretical or conceptual frameworks for research, there have also been problems in respect of quantitative as well as qualitative research designs. Bernard et al. (2004) point to problems of internal validity in experimental studies and quantitative surveys, as well as inappropriateness in the comparative studies between DE and F2F instruction (since their purposes and processes are different, and media use and associated pedagogy are also different).

Development of a few research frameworks during the past decades could be further considered in the Global South. The Delphi study of Zawacki-Richter (2009) provided a triad framework of macro-meso-micro levels which has been widely used by researchers in many parts of the globe. The Delphi study of Lee et al. (2004) covering six major areas and associated micro areas (design-related, development-related, management-related, evaluation-related, institution-

related, and theory and research-related) shall also be useful in organising research and formulating research designs. A recent framework developed in the context of evaluation of online learning for open educational resources from the point of view of return on investment (ROI) and return on expectations (ROE) (Panda 2019b) could be another framework to base ODDE evaluative research designs. The framework includes: evaluation of OER (accuracy, relevance, accessibility, quality, engagement/interaction, licensing), evaluation of Online Learning (course design, curriculum design, ease of comprehension, content adequacy, instructional design, technology design, assessment), and Return on Investment/Expectations (reaction, learning, behaviour, results, and investment/expectations).

It has often been pointed out that many research and research papers on ODDE are based on a poor theoretical and methodological footing. Long back Michael Moore (1985) had pointed out much badly designed research in DE, as well as that the quantitative studies (from which there has been a drastic move toward more qualitative studies) are also poorly designed. Saba (2014) advocated for mixed-methods research and the method of triangulation which provides rich data from multi-perspectives to have a comprehensive view on the complex operation of ODDE.

One significant aspect of research is research review and locating the research problem at hand for further investigation. With the developments in computerised software for both quantitative and qualitative data analysis and for document/content analysis, researchers today are largely using the PRISMA technique, and the efficacy of such other techniques may be explored further.

A foremost prerequisite for quality research (and therefore for publication in high impact journals) is a clear and logical link among 'research problem-conceptual framework-research questions-research design-data analysis-discussion and implications'. Most of the papers which are either returned or asked for major revision by the editors are due to lack of the above clear and logical link. What has been comparatively more neglected in ODDE research is the paradigmatic position that the researcher undertakes, which eventually guides the research questions, research design, and research analysis. Even the same research problem can be (and should be) studied from the perspectives of multiple paradigms. Zawacki-Richter and Anderson (2014) in their review, pointed out that DE editors do not distinguish between open-access and proprietary publishing, and that open access journals will attract more citations than the other.

Based on the personal experience of this author, it is underlined that research publications have generally been positioned for competition of scholarly publishing and for meeting credential requirements for promotion and tenure, rather than improving policies, systems, and sometimes practices. It is a serious matter for future researchers to also investigate this aspect comprehensively to ensure research effectiveness, as also the return on investment.

Policy, and research as professional development

As noted by Aluko and Coetzee in the 'Introduction' to this book, policies, parity, quality, expertise/competency, and integrated use of ICT have been the major constraints in the African context. This is, though, in no way different from other national contexts in the Global South. Research on ODDE considerably depends on these preconditions/prerequisites, though individual faculty may undertake research activities on their own, sometimes without any institutional funding support (Panda 2000). Two considerations emanate from this: (i) research studies are needed on policies on distance education (Makoe 2018) and how research outcomes inform institutional policies and practices; and (ii) the contours and trajectories of 'research as professional development' need to be analysed and developed (Panda 2005).

The development of the 'practitioner research and evaluation skills training in open and distance learning' (PREST) was a considered decision by the Commonwealth of Learning (CoL 2004) to facilitate research training/professional development, as well as research output in ODL. The seven areas/modules, each comprising three volumes (research foundation, research design, and research literature) under seven priority areas of research—programme monitoring, measuring outcomes, costs and economics, programme evaluation and quality assurance, marginalised and disadvantaged students, tutoring and learner support, and media and technology—are rich resources to convert into professional development packages and courses for ODL.

In a recent roundtable of ODL journal editors at the Pan Commonwealth Forum (PCF 10) at Calgary, Canada, presentations and discussions by three editors—Rory McGreal for *IRRODL*, Som Naidu for *DE*, and Santosh Panda for *JL4D*—acknowledged the limitations of researchers and research publishing and underlined the further need to mentor mid-career researchers to come up with quality research studies on ODDE. A subsequent offshoot of that is an excellent mentoring programme—'open and distance learning practitioners research training and mentorship programme' (ODLPRTM) of COL—which includes 30 participants from fourteen countries for the 2023 Cohort. The mentoring by established ODDE experts from the Commonwealth includes training on research paradigms and designs, quantitative and qualitative data, research ethics, action and evaluation research, planning and authoring research proposal, and article writing.

While the current and future research on ODDE should have a judicious balance between the traditional 'course-learner support' model on the one hand and the current 'networked-interactive-intelligent' model on the other (Panda 2022), it should also focus on investigating the change management model of 'policy-technology-capacity building' (Mishra and Panda 2020) for ODDE, and for 'learning for development'.

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