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EDITORIAL

Technology and ODL for Continuing Professional Development and Lifelong Learning

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The Discourse

While on the one hand there is a strong relationship between technology and open distance learning (ODL), on the other hand both influence how continuing professional development takes place and how lifelong learning occurs. Technology and ODL are now globalised developments, though their implementation is contextual. Globalisation and liberalisation have had a significant impact on how technologies have evolved and expanded across the globe (Panda, 2007, 2025a) — starting from the earlier phase of print technology, carrying on through the broadcast and conferencing era to the semantic web and intelligent flexible learning, including the current artificial intelligence (AI) with influential developments in education 4.0 (Bonfield et al., 2020) and globalisation 4.0 (Samans, 2019).

Technology has considerably influenced open, distance, digital, and blended learning (ODDBL) with enhanced accessibility, flexibility, and openness (Bates, 2015); and due to this, learning is becoming more personalised, engaging, interactive and collaborative. Technological developments including asynchronous learning, learning management systems, social technologies and networks, ubiquitous technologies, AI and machine learning, virtual realities and augmented realities, digital repositories and digital libraries, open-source technologies, have all contributed to how people learn through ODDBL. However, it may be noted that in spite of massive tech developments and transformations in online learning, both the systems of "course material-tutoring" and "networked-interactive-intelligent" learning co-exist, especially in the Global South and the developing countries (Panda, 2023).

Besides multimedia and simulations and virtual realities and gamification, AI addresses learning gaps, adjusts difficulty levels, recommends individualised learning resources, and supports personalised learning through tailored learning pathways. AI also positively affects how online assessment takes place and how e-portfolios facilitate personalised deep learning (Chaudhuri & Cabau, 2017), and the process of online learning, despite issues relating to privacy and surveillance (Foster & Layman, 2020). Besides student information systems and learning analytics and the tracking of learner performance, cloud-based technologies facilitate operational scaling-up, data security, virtual data storage, virtual classrooms alongside virtual collaborative tools and virtual collaboration (Aljawarneh, 2020). In times to come, technology vis-à-vis ODDBL shall continue to engage with AI-based technological developments including intelligent tutoring systems (ITS), virtual reality (VR), augmented reality (AR), metaverse environments (ME), blockchain technologies (BT), academic credentialing, and global learning networks (GLN), among others, though pedagogy and learner-centred learning shall continue to be at the heart of any technology engagements (Panda, 2022).

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Besides ODL and online learning, blended learning already occupies a sizeable place in institutional practices in schooling and higher education as well as in vocational education and training (Panda et al., 2024; Misra et al., 2025). Blended learning also enhances the effectiveness of training and professional development and lifelong learning, though one has to consider quality outcomes more rather than being bogged down by cost-efficiency (Panda, 2024).

A significant formulation, grounded in theoretical frameworks and in evidence-based practical applications, is the Policy-Capacity-Technology (PCT) model of technology-enabled learning, adopted and practiced by the Commonwealth of Learning, which underlines three important verticals — formulation of appropriate institutional policies, continuing staff development for using technologies for pedagogic purposes, and providing for equitable and accessible technologies for teachers and students (Mishra & Panda, 2020). Over the years, and especially post-Covid, capacity building and professional development programmes have gone beyond face-to-face mechanisms to adopt online and blended training, micro-credentialling and digital badges, e-portfolios (e.g., reflective journals, work samples, digital badges), simulations (e.g., medical diagnosis, crisis management, financial decision-making, design architecture), webinars, MOOCs, gamification, virtual and augmented reality, and online professional networks. Engagement in the community of practice has become more social, experiential, connecting, self-directed, adaptive, and personalised. Technologies also facilitate organisational learning management systems, learning management platforms, talent management and data-driven decision-making, among others. Digital CPD is emerging as a futuristic strategy which not only facilitates CPD but importantly facilitates professionals, including teachers and trainers, moving toward more personalised learning, adaptive learning, immersive learning, and globalised open learning.

While technology facilitates professional development, technology and ODDBL significantly contribute to flexibility and quality in CPD, professional learning, and lifelong learning. ODDBL contributes to increasing access to and flexibility in learning, thereby contributing to continuing education and lifelong learning (Panda, 2011, 2025b) in formal settings (structured programmes of study), non-formal settings (community learning), and informal settings (self-directed learning). It expands access through OERs, MOOCs, social networks; promotes flexible, and self-paced and social learning; enhances engagement, personalised and adaptive learning; and provides for choice-based skilling and certification (digital badges, micro-credentials). Future lifelong learning shall be more digital and blended, with large scale use of AI, machine learning, blockchain, learning analytics, virtual learning ecosystems, and lifelong learning passports. AI and GenAI have significant implications for the practice of and research on adult education (Milana et al., 2024). Moreover, it is argued that continuing professional development itself is lifelong learning and lifelong education (Friedman, 2023). ODL also contributes to development of teacher professionalism (Hsien & Othman, 2025), lifelong learning of adult learners in higher education (Neves & Henriques, 2020), and empowerment of lifelong learning among open university students (Zuhairi et al., 2019). Several key themes as identified by Lindqvist et al. (2024) should also be useful in designing digital higher education for lifelong learning.

Papers in this Issue

Based on the brief discourse on the broader theme of technology, ODL and lifelong learning, and a brief analysis of research studies conducted in this area, in this November 2025 issue of the *JL4D,* we have included 14 peer-reviewed papers and two book reviews under the sub-sections

of: research papers, case studies, reports from the field, and book reviews, dealing with the main theme of this issue '*Technology and ODL for Continuing Professional Development and Lifelong Learning'.*

We have included nine peer-reviewed papers in the *'Research Articles'* section. In the first paper, Mishra, Jha and Bhagat present the evaluation findings of the benchmarking toolkit developed for TEL, developed and implemented by the Commonwealth of Learning. The evaluation focused on content validity, internal consistency, and inter-domain relationships, and the findings suggest the toolkit is a reliable and valid instrument for assessing TEL practices.

In the second paper, on AI in teaching-learning, Aquino and Perez found a positive attitude among teacher educators, though there are many challenges relating to access, ethical guidelines, and CPD which need to be addressed. Rullyana and colleagues, in the third paper, studied the research trends on micro-credentials in higher education, and suggest focusing more on the neglected areas of blockchain, gamification, personalisation of learning, curriculum integration, and blended learning.

Mubarok and colleagues undertook a bibliometric analysis of game-based mobile learning in higher education, the findings of which suggest important areas of research for the future — gamification, integration, and cross-cultural studies. In the fifth paper, Indiaka and co-authors found that, in school education, digital gamification contributed to deeper understanding, enhanced motivation, and active participation among students.

In a research survey on skilling in open universities in India, Agbu and colleagues found, through the COL project on graduate employability, that the graduates had only partial employability readiness. Though skilling was built into the curriculum, the teaching-learning practices were deficient in the organisation of the career events, interdisciplinarity, and industry mentorship. The authors propose a 6-C strategy to enhance graduate employability in the open universities. Related to skilling, in the seventh paper, Owo reports that in technical education, blended learning had a positive effect on students' academic achievement, though no gender difference was reported. The author suggests the integration of blended learning (including practical laboratory skills through electronic workshops) in the technical education curricula. The next two papers focus, respectively, on mobile learning and expectations from online courses. Mudra, in the eighth paper, suggests that university EFL learners had high engagement with mobile learning especially due to self-pacing, flexibility, diversified content, and collaborative learning. The barriers that learners encountered included socio-cultural factors, privacy concerns, and infrastructure concerns. In the ninth and final paper in this section, Ranganathan and colleagues report that physiotherapy students expected need-based content, use of videos, and conventional methods of skill evaluation in their online courses; and these findings should be useful in designing such skill-based online courses by others.

We have included three peer-reviewed papers in the '*Case Study*' section dealing, respectively, with AI, teachers' professional identity, and e-portfolios. In the first case study, Hul and colleagues compare the European and Ukrainian experiences in integrating AI into education and learning. The findings suggest that while the European countries were successful in this venture due to coordinated policies, proper investment, appropriate teachers' development and ethical use of AI, Ukraine was lagging in these parameters. The researchers' suggestions on proper regulation, infrastructure development, and professional support for integration of AI into teaching-learning should be useful for other countries, too. In the next case study, Bleasdale and Glover suggest that integrating teachers' voice into school-based teachers' training significantly contributes to teacher identity, self-confidence, collaborative learning, and teachers' overall

professional learning experiences. Romadlon and colleagues, in the last case study, suggest that 'speaking e-portfolio' has a positive impact on the well-being of non-EFL university students, their engagement with speaking activities, digital connectivity with classroom activities, and on creative self-expression. The authors suggest integration of digital portfolio into language learning.

The '*Reports from the Field'* section contains two peer-reviewed papers. In the first report Subramaniam and Santhi report that in open university education, the Al-powered feedback system was found to be very effective in formative assessment of students, and that such types of technology-integrated assessment reduced teachers' workload and enhanced self-regulated learning among students. In the second report, Mitra and colleagues report the positive impact of the 'school in the cloud' project implemented in India, the UK, and the USA. The project used the self-organised learning environment (SOLE) and minimally invasive education (MIE). The findings suggest a positive impact of SOLE pedagogy in democratising education, building skills, and enhancing sustainability. A sustainability framework, based on community engagement, institutional ownership and economic viability, suggested by the authors should be of significant use to both policy makers and practitioners of technology-enabled learning in the community of practices.

In the '*Book Review'* section, we have included two important book reviews — one on the future of higher education, by Amponsah, and the other on teachers' professional development, by Suja and Nurmala — which should enlighten readers more on these crucial areas in education and training.

In Conclusion

The findings of the papers included in the sections on research, case studies, and field reports and the book reviews of this issue of the *Journal*, read in conjunction with the 'discourse' analysis presented in the first section above, suggest significant contributions that technology and ODDBL have made to continuing professional development and lifelong learning. The findings and suggested future research directions given in each of the papers — relating to TEL, AI, micro-credentials, mobile learning, online learning, blended learning, e-portfolio, digital gamification, skilling and employability, and teacher professional identity — should be useful and handy to researchers, practitioners, and policy makers alike in contextualising technology-enabled ODDBL for capacity building, continuing education, skilling, and lifelong learning. We hope the papers engage our readers in their critical reflection and meaningful applications.

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