

## EDITORIAL

# Reflections on the Increasing Role of TEL in Learning for Development

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In the ‘Editorial’ to the last issue of our journal *JLAD*, we had noted that “For effective implementation of TEL, Panda and Mishra (2020) underlined that while ‘policy-capacity-technology’ could act as a theory of change model, open and distance institutions need to invest in our collective understanding of ‘learning’ in a ‘networked society’ and work toward implementation of TEL in relation to contextual socio-cultural and educational ecologies” (Panda, 2024, p. i). Deriving from this, it may be underlined that context and contextual understanding become very important insofar as technology deployment and application in ‘learning for development’ are concerned. ‘Learning for development’ (LfD) covers a wide range of themes, levels, and strategies, and these are also transforming in contemporary times. Research has been leading this transformation, and research on technology-enabled learning (TEL) contributing to and facilitating LfD should not only be contextual but, more importantly, look into the critical role of technology for community-based socio-economic development (Selwyn, 2023; Selwyn et al., 2020). Based on these formulations, we have selected and included 17 items (nine research papers, seven case studies, and one book review) in this issue of the *Journal*.

In the *Research* section, we have included nine papers. The first paper, by Mahendra and Killis, deals with the effectiveness of a virtual laboratory-assisted microlearning platform in enhancing students’ motivation and engagement in learning. The results show that use of a virtual laboratory enhanced students’ cognitive ability and practical skills and also their motivation and engagement, which inversely influenced academic achievement in the context of ODL. In the second paper, the effectiveness on e-scaffolding based modelling instruction is reported by Yana and co-authors to be more effective than regular modelling instruction for developing scientific reasoning in physics.

Ibáñez Ayuso, in the third research paper, found that in the Erasmus+ funded projects on micro-credentials, the implementation results showed that while those significantly contributed to the development of professional competencies, there was less stress given to non-formal education and engagement with diverse stakeholders. The author suggests a holistic and inclusive approach for micro-credentials to be more effective.

Esma Şenel reports in the fourth research paper that use of creative writing techniques through web 2.0 tools on digital platforms had a positive impact on students’ academic writing, and reduced their writing apprehension.

The subsequent five research papers deal with scientific reviews of research literature on various thematic areas of technology-enabled learning. Silaiyappam and Palaniyandi, in their review on immersive learning in teacher education, report that studies have focused more on virtual reality and augmented reality; quantitative methodologies dominated the research design, though there is a need to focus more on design research; countries like Spain, USA and Turkey have dominated the research volume, and studies generally have reported the positive effect of



immersive technologies on engagement, interaction and motivation, and also on technological-pedagogical-content-knowledge. Betaitia and co-authors, in their bibliometric analysis, report that research studies on dropout in MOOCs have focused on ‘variables’ like online learning, learning analytics, machine learning, deep learning, and artificial intelligence, among others, and ‘elements’ like motivation, course difficulty, time management, and inadequate engagement.

In the next research paper, on scientometrics analysis of research studies on more than four decades of leadership in online education, Karimi and Saha report that thematic areas included knowledge management and school administration, e-learning for higher order learning, remote learning during the pandemic, and collaborative global interest in leadership in virtual learning environments. In another bibliometric analysis of research trends in the digital education ecosystem, Cam and Chung identify four key research fronts for impact analysis — productivity, rate of growth, core papers, and citation — and the significant research areas of educational technology, blended/hybrid learning, online learning, virtual reality, and artificial intelligence. Anesti and Irwanto, in a bibliometric analysis on augmented reality, suggest that studies in this area are increasing post-2022; that the frequently used research variables included status, opportunities and challenges; and that there is a need to go beyond these variables of augmented reality in diversified areas of study.

The seven *Case Studies* from different national contexts focus on technology acceptance, heutagogy, virtual tutoring systems, open and distance learning, campus-assisted experimentation in the physical sciences, and online experiments in physics. The first case, by Doğan and Akca, focuses on the contribution technology acceptance makes to student commitment. The results indicated that while the Turkish higher education students had a strong favourable attitude to technology use, they displayed moderate dedication to technology. On the other hand, those who had a high commitment to higher education displayed equally high commitment to the use of digital technology. The authors suggest for appropriate technology integration in higher education.

Mynbayeva and co-authors, in a study on self-directed learning in the context of Education 4.0, report that while most higher education students considered self-directed learning as important and recognised the skill of ‘learning to learn’, the use of digital technologies contributes significantly to an increase in learners’ autonomy and self-directed learning. The authors suggest development and use of MOOCs, which may support Education 4.0 and heutagogical methods of learning. In a research review study, Prathigadapa and Daud report that virtual tutoring based on GPT-3 is more effective than the traditional method in the presentation of learning and enhancing student learning outcomes.

In the case study on student choice of ODL in Tanzania, Joseph Manase reports that factors like flexibility, accessibility, user-friendliness, easier access to digital resources, and online examination influence student choice for ODL, though the students faced some constraints relating to time management, quality tutors, and low connectivity in rural areas. In another case study, on physics school teachers in Morocco, Hamamous and Benjelloun report that the reasons for low use of Computer Assisted Experimentation (CAEx) included non-availability of appropriate hardware and software, lack of teachers’ training, and irregular hardware maintenance. These and other factors need to be considered by educational policy makers and leaders from this country and many others to effectively utilise the pedagogical benefits of CAEx. In the next case study, on the effectiveness of online experiments in physics, Poonyawatpornkul and co-authors suggest that while online experiments contributed to increasing student understanding of concepts, it also improved their learning outcomes. In the

last case study, Hilal Salim Marhoon Al-Mamari and Jeya Amantha Kumar report that in higher education in Oman, while variables like attitude and experience with online teaching predicted only just above one-third of MOOC readiness, while other variables like self-efficacy, administrative support, and colleague support had nothing to do with it. Those who had some experience in working with MOOCs displayed higher self-efficacy, though without much change in their attitude. The authors suggest for continuing professional development to translate higher self-efficacy into positive attitude and readiness among teachers to effectively implement MOOCs in their discipline's teaching.

The *Book Review* by Ferreira-Meyers, on the very contemporary, but emerging, skilling area of micro credentials, authored by Rebecca Ferguson and Denise Whitelock, should be useful to educational planners, leaders, administrators, teachers and researchers alike.

We hope that the findings of the research and case studies on diversified themes of technology-enabled learning and relating to the broader theme of 'learning for development', included in this issue of the *Journal*, shall be of interest and use to our readers.

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