



Open Technology-Enhanced Learning

COLLECTION:
OPENTEL

EDITORIAL

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ABSTRACT

Editorial introducing this special issue on interdisciplinarity in open technology-enhanced learning, explaining its roots in the work of the OpenTEL group.

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This special issue on Interdisciplinarity in Open Technology-Enhanced Learning has been motivated by the work of Open Technology Enhanced Learning (OpenTEL) – an interdisciplinary group of researchers based at The Open University (OU) in the UK with backgrounds including educational technology, STEM, social science, and organisational studies. The wide diversity of group members' backgrounds allows the exploration of openness and TEL in ways that can feed into teaching.

As Weller (2014) notes, openness has a long history in education, based on the belief that education is a common good, but changes in technology have brought about changes in understanding and practice, so that these days the emphasis tends to be on the availability of open content and resources. The OpenTEL group uses openness as an umbrella term (Weller 2014). It may involve any or all of the five 'Rs' of openness identified by Wiley (2014): the right to retain, reuse, revise, remix or redistribute a resource. It may also be motivated by a desire to increase audience, reuse, access, experimentation, reputation, revenue, or participation.

The group considers 'technology-enhanced learning' (TEL) as a phrase that encompasses earlier terminology, including computer-assisted learning, e-learning, cyberlearning, and digital learning. The broad focus is on digital/online technology used in a way that is intended to improve in some way upon a previous approach to teaching and/or learning (Murphy, Iniesto & Scanlon 2022; Weller 2022).

Together, openness and TEL offer a particular perspective on a wide range of research areas. Some of these areas – learning analytics and design (Nguyen, Rienties & Whitelock 2022), learning at scale (Ferguson 2019), and artificial intelligence (Holmes et al. 2019), for example – are clearly technology related. Some, such as assessment (Minocha, Murphy & Scanlon 2021) and citizen science (Herodotou et al. 2022), are impacted by technology. Others – openness (Iniesto et al. 2021), inclusion (Lister et al. 2022), and learning opportunities designed for migrants and refugees (Charitonos 2022) – connect TEL with much broader fields of study.

This wide range means TEL as a field is inherently applied and multidisciplinary (see, for example, Scanlon and Conole 2018). Increasingly, the complex cross-disciplinary difficulties presented by technological and pedagogical challenges demand new approaches, a rich set of theoretical perspectives, and innovative research methodologies. It is also a complex field as was recognised in the Beyond Prototypes project which examines the translation of TEL research into persisting projects. "*Technology-enhanced learning consists of much more than a set of research-informed products. It is a complex system, which includes communities, technologies and practices that are informed by pedagogy (the theory and practice of teaching, learning and assessment)*" (Scanlon et al. 2013: 3).

The Beyond Prototypes project introduced the idea of the TEL Complex (and a pictorial representation of it) as a way of representing the complexity of the ecosystem in which solutions to educational challenges involving technology are situated. This ecosystem has four main elements: pedagogy, technical components, ecology of practices and technical context communities (Scanlon et al. 2013).

OpenTEL operates as a group of colleagues interested in thorough pedagogical research. The group connects multi-disciplinary professionals, enabling them to look at learning from a holistic perspective – particularly at how context and environment shape both learners and learning. The OU's long-standing Computers and Learning Research group (CALRG) has inspired and given a solid grounding to work within OpenTEL and the connection of the group with the OU's Institute of Educational Technology (IET), together with the enthusiastic participation of IET staff in both groups, have been very important to the success of our activities (Ferguson, Jones & Scanlon 2019).

Signature features of our work are interdisciplinarity, openness, inclusion, social justice, and the transfer of research into practice. Cross-university joint activities are coordinated by special interest groups including those on AI, Openness and Inclusion, Citizen Science, Assessment and Feedback, and Learning at Scale. We have also worked on an ethical framework and on how we perceive ethical considerations in TEL over a lifecycle: from procurement to adoption by students, to the evaluation of effectiveness by researchers. This work on ethics in educational technology encompasses the themes of openness/transparency, inclusion/accessibility, and social justice, and these themes facilitate the transfer of research into practice. Scanlon (2021)

argues that educational technology is what educational technologists do. Similarly, OpenTEL is defined by what its members do.

The community's focus on openness – opening up research, methods, access to education, and learning – has enabled it to bring together methods, research and practices from many different disciplines. Doing this has brought together a rich variety of perspectives. Taking an interdisciplinary approach has facilitated a deeper understanding of TEL in its different forms.

This special issue brings together work by researchers both inside and outside the group that relate to themes explored by OpenTEL over the last five years, demonstrating how these themes can be applied across disciplines. Together, the papers highlight some of the major barriers to learning – lack of resources, unequal access to resources, limited access for people with disabilities, and a growing recognition of the scale of mental health issues – and identify ways of reducing these barriers in TEL contexts.

In low-resource countries, access to educational technology is more limited than elsewhere, resulting in a digital divide. Factors such as network issues, limited or intermittent power supply, and varying levels of digital literacy hinder effective online learning. These factors meant that the sudden global shift to online learning during the Covid pandemic had the potential to deepen the digital divide between countries. Dawadi and her colleagues (Dawadi, Goshtasbpour & Kukulska-Hulme 2024) explore students' experience of this shift in Kenya and Nepal and the range of factors that prevented students from engaging with remote/online activities. Their paper identifies multiple sources of stress and anxiety, challenges in learning interactions and assessment, and negative impacts on career plans. University initiatives designed to help students were not always successful and although learners valued support from both their institution and the wider community, this was not always available. The paper identifies practices and strategies that can be adopted in low-resource contexts both to support learning and to reduce anxiety related to online learning.

In the case of Kenya and Nepal, the digital divide is geographical; most people in these countries have less access to information and digital resources than people in wealthier countries. The digital divide can also manifest in other ways. In their paper, George-Reyes and his colleagues focus on the gender-related digital divide and ways in which this might be reduced (George-Reyes, Peláez-Sánchez & Glasserman-Morales 2024). They argue that interacting effectively in virtual environments requires communicative literacy and complex thinking, which women may not have opportunities to develop due to factors such as lack of economic resources, gender stereotypes, and cultural norms that limit their participation in TEL contexts. They suggest that 'Education 4.0' – which they characterise as focusing on problem-solving, integrating emerging technologies, and implementing innovative strategies to enhance pedagogical processes – could help to reduce this gender digital divide.

For other learners, resources and skills training may appear to be available but limited accessibility options restrict access. Coughlan and his colleagues (Coughlan, Iniesto & Carr 2024) look at ways in which access to learning for disabled students could be increased by using artificial intelligence (AI) and chatbot technologies that understand disabled students in their own words and are able to respond with relevant suggestions of technologies, strategies, and resources that could help remove barriers to learning. This work, based on the perspectives of students with disclosed disabilities, provides a potential foundation for the effective design of systems that could crowdsource a knowledge base, hold meaningful conversations, and make relevant recommendations to individuals.

On both sides of the digital divide, increasing numbers of students are disclosing mental health difficulties, challenges, and conditions. TEL has a role to play here because it offers the possibility of providing alternatives to traditional educational practices, supporting students who would otherwise be unable to access study opportunities, and underpinning changes to practice. In their paper, Lister and her colleagues (2024) describe work related to the *Positive Digital Practices* project, which is designed to scale up existing work on mental wellbeing in TEL. They present data on perceptions of barriers and enablers to that wellbeing, explore examples of positive practices, and provide links to openly available resources that can be used to support those practices (Lister et al. 2024).

Overall, the papers in this special collection identify some of the major barriers to making full use of TEL and point to ways of reducing or removing those barriers in order to open learning opportunities to many more people around the world.

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COMPETING INTERESTS

The authors have no competing interests to declare.

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