INNOVATIVE PRACTICES of TECHNOLOGY-ENHANCED LEARNING

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PENERBIT UNIVERSITI PENDIDIKAN SULTAN IDRIS
TANJONG MALIM, PERAK
2021
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PREFACE

Technology has the potential to transform teaching and learning practices. Information communication technologies (ICT) for transforming education has been noted in research through the last three decades. Although the conceptions of use of ICT and the effect of the transformation seem to vary, the focus was always on learning and improvements in the cognitive processes for learning. The emergence of web 2.0 technologies led to the need for transformative practices in higher education. Bates and Sangra (2011) in their book “Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning” addressed this need as they suggested ways to use technology to transform educational practice in higher education.

The process of transforming teaching and learning is a complex process which may involve changes in teachers’ beliefs and conception of teaching and learning. In Malaysia, the Malaysian Education Blueprint 2015 – 2025 (Higher Education) lists transformation of the delivery of higher education as one of the shifts in the aspiration to deliver a world-class higher education system. For this purpose, change is required in the processes of learning so as to develop students with enhanced capabilities to be future-ready Malaysians, as well academics who could perform this task (Ministry of Education, 2015). Hence, academics and students alike may need to unlearn and relearn concepts of teaching and learning.

This book is an effort to achieve the aim of transforming education through technology-enhanced learning (TEL) and to showcase practices from Malaysia and surrounding regions. The task of transforming education is not limited to Malaysia, as the concept of education is evolving. This is especially made evident during the COVID-19 pandemic when the delivery of education had to change.
Hence, in order to be competitive, all higher education institutions need to consider transformative practices. Traditional practices of teaching may not be suitable for preparing our youth for the technology-rich and competitive future. Hence, TEL practices may help enhance this transformation.

TEL is concerned about the “enhancement” of learning using technology. In the Malaysian context, technology has been used as an “enabler” when the Smart School concept was introduced in 1996, putting emphasis on the pedagogy rather than on the technology. Hence, technology is an enabler when access (including at anytime and anywhere) to resources on online platforms or courses such as Learning Management systems and Massive Online Open Courses (MOOCs) is provided. Technology is also an enabler when contextualised situations and simulations are provided for the learner to visualise and practice in sometimes risky situations (Gauttier, & Arnedillo-Sanchez, 2016).

The concept of TEL needs to be carefully determined. UNESCO’s International Bureau of Education (http://www.ibe.unesco.org/) defines TEL as the use of “information and communication technologies as mediating devices supporting student learning”, which encompasses different applications and processes from the delivery of digital content to creation of resources to inform learners and enable learners’ reflection so as to integrate new knowledge into existing knowledge structures. Although the collaborative processes for learning is highlighted in the UNESCO’s definition, they do state that TEL is also referred to as ‘e-learning’ (or electronic learning) and ‘digital learning’. Hence, a common misconception is that TEL is e-learning.

The role of technology in TEL is to enable new learning experiences and enrich learning through interactive and collaborative digital media (Laurillard, Oliver, Wasson, & Hoppe, 2009). In Kirkwood and Price’s (2014) review of literature on TEL, there were three types of interventions for TEL practice: interventions that replicated existing (traditional) teaching practices new technologies; interventions that supplemented existing teaching with resources or tools so as to increased flexibility for learners, and interventions which transform and enrich teaching and/or learning processes and outcomes, example active learning and collaborative learning. Hence, the current practice of TEL may still be related to traditional teaching and not all has been transformative. Hence, with this book, we hope that the TEL practices
outlined will enable other researchers to use as exemplars to transform and enrich their students’ learning.

In TEL, technology is the “enhancer” of learning. Gauttier, & Arnedillo-Sanchez (2016) claims that this is a person-centered event, and in this case, a student-centered event, to extend the abilities of the individual, either his competency, mood or performance. This could mean enhancing memory, flexibility or time spent on a task, improving engagement or attitude, test scores, deeper understanding and reflection, or even improved interactions and sharing online (Gauttier, & Arnedillo-Sanchez, 2016). Hence, in this book, Laurillard, Oliver, Wasson, & Hoppe’s (2009) definition of TEL is taken, where the role of technology is to enable new learning experiences and enrich learning through interactive and collaborative digital media.

In Chapter 1, Technology-Enhanced Learning: Benefits and Considerations, the evolution of technology from computer-based training to e-learning models is discussed before going into the tools for TEL and the benefits. Lastly, suggestions on implementing TEL are shared.

In Chapter 2, Blended Learning in Action: Innovative Practices, Methodologies, and Implications, an overview of blended learning and the characteristic features is elaborated. Blended learning is one form of TEL due to the flexibility of the learning as well as the interactive processes involved. Several models of blended learning are discussed, and findings regarding students’ readiness for blended learning is described. This data indicates the form of blended learning preferred (50% blended) as well as the forms of online media preferred. This would be useful for lecturers and teachers when designing their TEL environments.

Chapter 3 is on Technology applications used among undergraduates from 2013 to 2018 and the implications for instruction. The technology applications used by undergraduates is elaborated. Most of the applications are collaborative and interactive tools which may not be used specifically for learning. However, there is potential for some of these tools to be used for learning as majority of students have access to them. However, the trends related to the use of tools shows that some technology apps that were popular 5 years ago have declined in popularity. Hence, technology changes according to the needs of the community. Instead of focusing on learning specific technology tools, it is more important to encourage life-long learning skills, and allow students to develop on their existing skills, using apps
that students were familiar with for learning. This may also engage learners for TEL.

Lecturers may not have the capabilities and skills to implement TEL. Hence, it was important to investigate the perceptions of TEL among university educators. For this purpose, in Chapter 4, Perceptions and Challenges in Blended Learning Approaches among University Educators, was investigated. In the higher education institution sampled, majority of educators do not have sufficient knowledge in using blended learning. The implication of this study is that administrators and managers need to be aware of this situation and provide opportunities for educators to be trained in TEL practices. This would enable the transformation of educational practices in line with the needs of the students so that their institutions could be competitive.

The next section of the book looks into implementing TEL in the classrooms. As the aim of the book is also to share best practices in TEL so that it can be implemented by other practitioners, the chapters have been organised such that the definition of the technology and some additional links to implementing the technology are given. In addition, the instructional strategies in using the technology is suggested.

A mobile e-book for learning abstract algebra was used for TEL in Chapter 5, Implementing E-Book in a Mathematics Course: Investigating Postgraduate Students Patterns of Usage. The patterns indicated that there were some difficulties in some of the tools which the students used. In addition, the search feature in the e-book was useful for the students. Hence, e-books and other resources should be considered for interaction and collaboration in TEL.

Videos were used in flipped classrooms in Chapter 6, “Eye-Tech”: Flipping Fundamental Funduscopy For Medical Students. Flipped classroom, a form of blended learning, can be used for TEL as it enables interactions and collaborations, especially during the face-to-face sessions. In this chapter, the limited class time was spent in more effective processes.

Features of gamification can engage learners. In Chapter 7, Gamification in a Blended Learning Environment: The Mojo of ClassDojo, presented a strategy for using this application in engaging students, based on the Octalysis model. The challenges that arose from using this app was also discussed.
Assessment related to TEL may pose some difficulties. In Chapter 8, an innovative form of assessment is presented in Screencasting For Assessment of Content Knowledge: Learners’ Experiences and Beliefs. Learners develop screencasts based on their readings and present it among the other participants in their community of learners. The ability of the learners in developing their screencasts and the effectiveness of conveying their knowledge was investigated. As a form of assessment, this can develop cognitive processes and higher order thinking for TEL.

TEL should enhance understanding, especially when the cognitive processes are activated. In Chapter 9, Augmented Reality (AR) Experiences: A Tool to Enhance Conceptual Understanding for Education Counselling Students, additional information in the form of videos was augmented on posters students viewed to enhance understanding. The usability of the tool and the effectiveness for learning was investigated. This proved to be an engaging way to learn and to collaborate.

In Chapter 10, Blended-learning applied in a joint master program in Vietnam – voices from professionals, discussed the voice of instructors using a learning tool, Brightspace. The study was discussed from the dimensions of blended learning. The thoughts and pedagogical implications in using TEL was recorded.

Learning Management Systems such as MOODLE offer a suite of applications on a platform, which is at most times customised to the institution. Most times, the instructor need not even look for other applications as the most pedagogically-sound tools would have been included for TEL. In Chapter 11, Instructor Characteristics and Satisfaction in a Blended Learning Implementation Environment, instructor characteristics as well as level of use and satisfaction was investigated. It is hoped that the predictors of the characteristics of successful instructors for TEL implementation could be determined.

In the next chapter, a creative school environment is designed. Chapter 12 is on Building A Creative School Environment to Push Technology- Enhanced Learning – Case Study at Schools in Vietnam. Creative TEL environments could be designed and the researchers suggest several solutions.

Lastly, In Chapter 13, a motivational instructional design model is used to engage students in using virtual reality for learning. Virtual
Reality for Evoking Emotions: A Motivational Design for Instruction used the ARCS motivational model to design an environment to engage with trainee counsellors and show them the potential of this tool to engage their clients and evoke emotions during sessions as future counsellors.

REFERENCES


VIRTUAL REALITY FOR EVOKING EMOTIONS: A MOTIVATIONAL DESIGN FOR INSTRUCTION

Dorothy DeWitt and Donnie Adams

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<td>The ARCS (Keller, 1987) model of instructional design is used in the design of instruction. The activities for using the Virtual Reality headset and apps were designed for the following sequence of ARCS: Attention, Relevance, Confidence and Satisfaction. The VR apps we used to gain attention, show relevance in their future work as counsellors, and to gain confidence and satisfaction in their use.</td>
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1. Introduction

The topic of “Mobile applications used for counselling” could be taught in a traditional instructivist approach for undergraduate students, where the mobile applications (apps) were identified and their use for counselling was explained. This would enable the undergraduate students to acquire the understanding and realise the potential of mobile apps for counselling. However, this approach addresses only the cognitive domain of learning and neglects the affective and psychomotor domains. In order to experience the emotional aspect of immersion in the use of mobile apps for counselling, virtual reality (VR) was selected as it could evoke the affective and psychomotor domains of learning. For this purpose, a motivational model of instructional design, the ARCS model (Keller, 1987) was selected to design the learning experiences. Hence, the purpose of this study was to investigate the learner’s reaction towards the use of VR and whether they would use VR as counsellors in the future.

2. Virtual Reality

Virtual reality (VR) is a computer-generated simulation in which users can interact synchronously in real-time (DeWitt, 2018; Innocenti, 2017; Yang, Chen, & Jeng, 2010). Originally used for the gaming industry, VR has the potential to engage users in synchronous situations. As the users’ actions are tracked and displayed through an interface, this
Virtual Reality for Evoking Emotions

This sense of Presence is dependent on the context and the psychological response of the user towards VR (Dalgarno & Lee, 2010). As the sense of presence is an illusion, it is dependent on the interactions in the virtual world which may contribute to the sense of immersion (Tussyadiah, Wang, Jung, & tom Dieck, 2018). The sense of immersion may be sensory, conceptual and motivational (Dalgarno & Lee, 2010).

In VR, the user can assume an identity and be seen as an avatar or an alternative self within the virtual environment. The embodied actions and interactions of the user contributes to a rich psychological immersion, experienced in the virtual world. Hence, the sense of presence in the virtual environment, the effects of the immersion and the creation of an identity, occurs as a result of the representational fidelity and the interactive capabilities of the virtual environment (DeWitt, 2018). The higher the fidelity and interactive capabilities of the device and the application, the more realistic the environment. Hence, in this study, an application and device which can provide a reasonably good representational fidelity would be selected to enable the users to experience the immersive VR environment.

The affordances of presence and immersion has made VR apps suitable for use in counselling. The computer-generated simulations of VR can be used to mimic real-world situations with fairly accurate representational fidelity and interactivity. This allows users within their own avatar, to create an identity and be immersed in an alternative environment. Thus, the potential is for counsellors to use VR to administer cognitive behavioural therapy (CBT) and exposure therapy (ET) to address mental health problems and social issues such as avoidance of social situations and fear of heights. Virtual reality exposure therapy (VRET) can provide a safe virtual environment and in a controlled manner for users (Senson, 2016).

There has been research on VR in treatment of trauma patients, in particular for post-traumatic stress disorders (PTSD) among soldiers and war veterans. The application, Bravemind, was developed at the University of Southern California for the Medical Virtual Reality center for the use in prolonged exposure therapy (PET) for PTSD victims to be immersed in war zones in virtual Iraq and Afghanistan (Senson, 2016; US National Library of Medicine, 2017). A study comparing the use of VRET alone, and a combination of VRET with drugs, showed that VRET alone was as good as the combination
The process of transforming teaching and learning is a complex process which may involve changes in teachers’ beliefs and conception of teaching and learning. In Malaysia, the Malaysian Education Blueprint 2015 – 2025 (Higher Education) lists transformation of the delivery of higher education as one of the shifts in the aspiration to deliver a world-class higher education system. For this purpose, change is required in the processes of learning so as to develop students with enhanced capabilities to be future-ready Malaysians, as well academics who could perform this task (Ministry of Education, 2015). Hence, academics and students alike may need to unlearn and relearn concepts of teaching and learning.

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