Skills, practice and challenges in the adoption of learning technologies in training and adult education

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Training and Adult Education is critical to Singapore's effort to compete in the global economy and respond to its major economic and social challenges. iN.LEARN 2020, a key SkillsFuture initiative was introduced to catalyse the adoption of blended learning, through the use of technology-enabled learning and workplace learning, to enhance learning accessibility and relevancy. This paper reports the first nationwide survey that investigates the training and adult education landscape in Singapore. The findings provide baseline information of the current status of the use of learning technology in training and adult education and highlight issues and challenges in the adoption of learning technologies. A considerable proportion of training providers (47%) and adult educators (77%) reported using learning technologies in their training related work, however, use of learning technology may not linked to better learner experience or deep learning. Cost and lack of expertise are main obstacles to effective adoption of learning technologies. It provides implications to training organisations and adult educators to review their current programmes and skills, and to better design and implement technology enhanced learning. It also has implications for building partnerships among government agencies, enterprises and training providers and professionals to favourably exploit cutting-edge technology to support learning and performance.

Keywords: technology enhanced learning, learning technologies, pedagogical innovation, training and adult education, adult educators, training providers, skills

Introduction

Learning in traditional settings is making way for more digital and interactive approaches. Varied formats and individualised learning provided on e-platforms and at the workplace provide learners the flexibility to learn the way they prefer (Hodgkin, 2009). In educational institutions and corporate training, technology enhanced learning has become increasingly important (Zhang & Cheng, 2012; Garrison & Kanuka 2004). For the purpose of this study, technology enhanced learning refers to any learning that leverages on technology, including for example, e-learning, online learning, learning on simulators, mobile phones, augmented reality or virtual reality.

Many have argued the effectiveness of technology enhanced learning and some are concerned that technology enhanced learning may just be a fad in training and education (Hofmann, 2006). Nonetheless, the adoption of technology enhanced learning has been undeniably increasing by businesses and educators because of its flexibility, cost-effectiveness, and relevancy. FELTAG (Further Education Learning Technology Action Group) advocated that learning technology facilitates personalize training, providing autonomy to learners (Hutchinson, 2016). In training and adult education, autonomy is especially essential as it provides adult learners with flexibility to choose their preferred time and pace for learning to accommodate other commitments from work and family (Graham, 2006). In addition, what makes blended learning attractive is also because of its potential and promise in providing authentic learning environment (Herrington, Reeves and Oliver, 2010; Institute for Adult Learning, 2016). Well designed and implemented, it could improve learner engagement and participation which would lead to better learning outcomes (Hewett, 2016; Badawi, 2009). For business, blended learning can extend the reach of training in terms of access and flexibility with variety of formats and elements to ensure that all learning styles (visual, auditory, kinaesthetic) would be met whichever works for the employees to keep them stimulated in learning, and allow them easy access to learning anytime, anywhere (Korr, Derwin, Greene & Sokoloff, 2012; Osguthorpe & Graham, 2003; Singh, 2013).

Singapore is in its digital journey with its Smart Nation initiative to drive the nation to be the leading digital economy as detailed in three national plans namely, the Digital Economy Framework for Action, the Digital Government Blueprint, and the Digital Readiness Blueprint. Within the Digital Economy Framework lies the Industry Transformation Maps that facilitate guidance to companies and the workforce across sectors in adopting and stressing technology and innovation to transform enterprises and improve productivity. In line with the nationwide digital journey, the Training and Adult Education (TAE) sector of Singapore launched the iN.LEARN

2020[1] (SkillsFuture, 2017) as a national strategy to catalyse the adoption of technology-enabled training and adult education. Blended learning offers the potential to create new and innovative educational solutions and improved learning experience; however, how this can be achieved is usually not straightforward. Despite an intensive search of available literature on the Internet, there is a paucity of publications on blended learning in the training and adult education in Singapore. The lack of readily available research and exemplars of blended learning adoption in the TAE sector could be seen to be impeding the adoption of blended learning and the implementation of iN.LEARN 2020.

Methodology

We use data from the first nationwide survey of the TAE landscape study (Chen, Ramos and Cheng, forthcoming). It was conducted by the Institute for Adult Learning conducted in 2017-2018, with a total response from 326 training providers, 535 adult educators, 252 training and management professionals, and 138 human resource developers. This is the first formal study on the TAE sector that hopes to uncover the profiles of the training providers and TAE professionals, their business model, the programme offerings, approaches and forms of delivery used, how technology is used to advance their business operations and training delivery. This paper will focus only on the use of learning technologies. Specifically, it aims to address the following questions:

RQ1: What is the current status of the use of learning technology by the training providers and adult educators in Singapore?
RQ2: To what extent are the skills of adult educators and training management professionals proficient to perform their current work in technology enabled learning?
RQ3: What are the challenges in the use of learning technologies reported by training providers and adult educators?

Results

Key finding 1: A considerable proportion of training providers (47%) and adult educators (77%) reported using learning technologies in their training related work, however, current use of learning technology may not be linked to better learner experience or deep learning.

As mentioned earlier, iN.LEARN 2020 promotes adoption of blended learning with a strong technology component, we therefore asked the current use of learning technologies by the training providers and adult educators in the study. A considerable proportion of training providers (47%, n=153) and adult educators (77%, n=411) reported using learning technologies in their training programmes and services in the last 12 months. We also asked what tools they have used and Table 1 lists the learning technology tools used by training providers and adult educators.

Table 1: Learning technology tools used by training providers and adult educators

	Percentage of Training Providers that used …	Percentage of Adult educators that used …
Audio-visual training aids (e.g. Smart boards)	35.9%, *n* = 117	66.2%, *n* = 354
Recorded video of training activities, contents (e.g. lectures, seminars, discussions)	31.6%, *n* = 103	57.8%, *n* = 309
Collaboration platforms (e.g. Google docs)	25.8%, *n* = 84	42.1%, *n* = 225
Learning management systems (e.g. Moodle, Canvas, LearningSpace, AsknLearn)	25.5%, *n* = 83	35.3%, *n* = 189
Web-based forums, online chats, online community of practice, polling	23.3%, *n* = 76	33.8%, *n* = 181
Web-based seminars/presentations (e.g. Blackboard Collaborate, Adobe Connect, virtual classrooms)	22.7%, *n* = 74	32.5%, *n* = 174

[1] iN.LEARN 2020 is a key SkillsFuture initiative, which is introduced to catalyse the adoption of blended learning, through the use of technology-enabled learning and workplace learning, to enhance learning accessibility and relevancy.

E-assessment (e.g. online quizzes)	21.5%, *n* = 70	32%, *n* = 171
Web-based chats, conferencing	21.2%, *n* = 69	26.9%, *n* = 144
Mobile applications for adult learning (e.g. Gnowbe, AcuiZen)	17.8%, *n* = 58	22.1%, *n* = 118
Gamifications	16.6%, *n* = 54	21.1%, *n* = 113
Simulations (e.g. augmented reality, virtual reality)	14.1%, *n* = 46	20.9%, *n* = 112
E-portfolios	14.1%, *n* = 46	20.7%, *n* = 111
Others	2.6%, *n* = 4	2%, *n* = 2

As can be seen from the table, the top learning tools used by the training providers and adult educators were similar: audio-visual training aids, recorded videos of training activities or content, and collaboration platforms. The use of learning technology seemed to be primarily asynchronous, i.e. one-way knowledge transfer, such as creating audio-visual training aids with Smartboard and recorded videos; but less frequently to connect learners to learner or context. For example, less than 15% of training providers and adult educators reported using simulations such as augmented reality or virtual reality. Given that most tools used were mainly for one-way knowledge transmission and the frequency of use was not high (~3 "Occasionally" out of a scale of 6 "Always"), the results could imply that current use of learning technologies in training might be more content-driven; but less dialogical or contextual, which may not lead to better learner experience or deep learning.

Key finding 2: Technology enhanced learning was identified as one of the emerging skills to support the organization's business needs, however, adult educators and training management professionals perceived their skills in technology enhanced and blended learning to be lower than classroom facilitation and are top needs for continuing professional development.

About 72% of the training providers invested on technology and automation in the last 12 months. They also indicated willingness to invest in technological and automation enhancements in the next 12 months (Chen, Cheng and Heng, 2019). Over 60% of training providers foresee pedagogical innovation and technology enhanced learning as emerging and critical skills that adult educators and training management professionals need to be equipped with in order to support the organization's business needs. However, the adult educators and training management professionals self-reported that they were least skilled in this areas. Figure 1 shows that over 90% of adult educators reported they were proficient in classroom based learning, however, the percentage that were proficient in technology enhanced learning and blended learning dropped to around 75%.

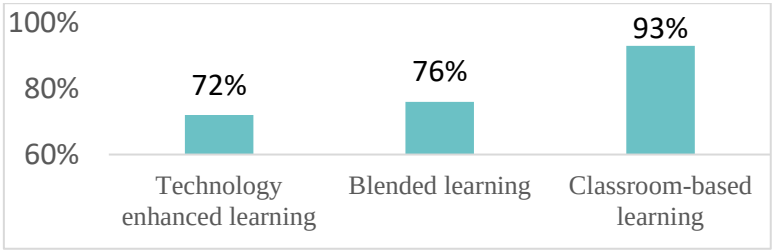

Figure 1: Percentage of adult educators who are proficient in the skills

Similarly, for training management professionals, the percentage that reported proficient in learning technology management and digital skills were lowest as compared to other skills that were critical to their work. See figure 2 below.

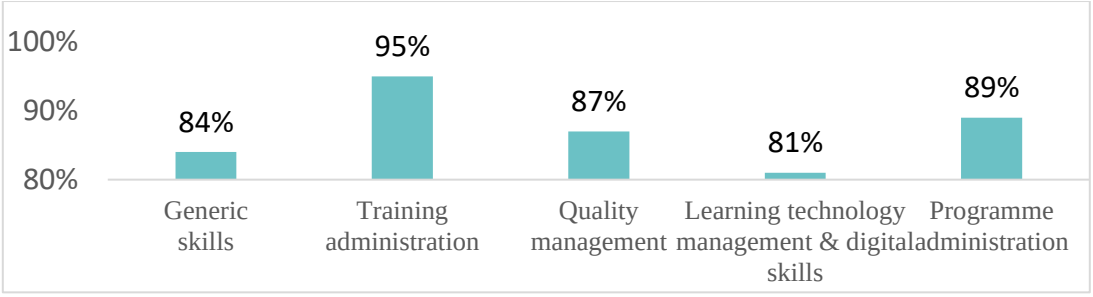

Figure 2: Percentage of training management professionals who are proficient in the skills

The survey also asked the areas that adult educators and training management professionals needed continuing professional development (CPD). Top CPD needs reported by adult educators were: learning analytics, curriculum design and development for technology enhanced learning, curriculum design and development for blended-learning. And top CPD needs reported by training management professionals were: learning technology & system management, digital literacy, curriculum and programme management. The findings show that technology enhanced learning is a key trend in the TAE sector and adult educators and training management professionals are aware of the gaps in their skills in this area. There is a need for quality CPD provision in this area to help them meet the changing demand in their work.

Key finding 3: About 1 in 3 training providers (31%, n=102) are still doing classroom-based training only; thinking that their current mode of training delivery can meet the clients' needs. Cost and lack of expertise were main reasons reported by training providers for not adopting learning technologies.

About 1 in 3 Training providers (31%, n=102) are still doing classroom-based training only. About 53% (n=173) of training providers did not use learning technologies at all in the last 12 months. The top reasons for not using learning technology included: current mode of training delivery was enough to achieve the learning outcomes (47.4%, n = 73), learning technologies were too costly and would not reap the returns on investment in the next 2-3 years (33.8%, n = 52), and lack of expertise to design and manage high quality technology enhanced programmes (31.2%, n = 48), see Table 2.

Table 2: Reasons for not adopting learning technologies

Reasons for not adopting learning technologies reported by training providers	
Current mode of training delivery can meet the learning outcomes effectively	47.4%, *n* = 73
Too costly and will not reap the returns on investment in the next 2 to 3 years	33.8%, *n* = 52
Lack of expertise to kick start	31.2%, *n* = 48
Lack of financial resources to kick start	29.9%, *n* = 46
No need as my clients prefer traditional mode of delivery such as classroom training	26.6%, *n* = 41
No resources to explore what learning technologies are available in the market	26.6%, *n* = 41
Not ready as we do not have a business plan ready for adopting learning innovation	20.1%, *n* = 31
Others	1.3%, *n* = 2

Other reasons reported in the above table was regarding the learners, as one training provider mentioned that some learners were not proficient in the ICT skills thus not ready to adopt learning technologies. One training provider also mentioned it was difficult to decide which learning technologies to use from the diverse and fast changing tools and technologies in the market.

Conclusion

The TAE sector is embracing learning technologies to respond to the changes in the market with close to half of training providers and 4 in 5 adult educators adopting learning technologies in their training programmes and services. However, our results also indicated the demand for technology enhanced learning seem not to be fully picked up among training providers yet, with 1 in 3 training providers were still doing classroom based training only, thinking it can meet the demand of the learners and enterprises.

Whether the mere adoption of learning technology should be taken as successful or effective would require a closer look into how learning technologies are used and whether they are linked with better learner experience and learning outcomes, not just its mere use per se. Learning technologies were found to be not frequently used overall, and when used, it was basically for knowledge transfer like the use of smart boards and recorded videos.

Lack of expertise in technology enhanced learning design and delivery is one big obstacle reported by training providers towards adopting learning technology in their programmes and services. The adult educators were aware of their skill gaps when it comes to adoption of blended learning and learning technologies. They self-rated their proficiency in technology enhanced learning and blended learning as lower than traditional classroom mode of delivery. Adult educators also reported high need for continuing professional development in this area. While they may see the use of learning technology as a trend, how to develop pedagogical expertise for technology enhanced

learning is not an easy process. Understanding their challenges is an important first step towards capability development (see Cheng & Chen, 2019).

The findings provider some implications to policy and practice. Leaders of training organisations need to evaluate and predict the market trend and build innovative culture to encourage staff at all levels to be part of the change process to embrace innovation and new ways of training and learning (Chen, Chia, & Bi., 2019). At the same time, it is important to create awareness and understanding about technology enhanced learning, and look at the developmental cost holistically (Chen, Cheng & Heng, 2019).

It also has implications for building partnerships among government agencies, enterprises, training providers and professionals to tackle issues related to capability development, infrastructure support and resources provisions for technology enhanced learning. All stakeholders in the ecosystem has a role to play to support organisations and professionals to share knowledge, gain access to learning resources and develop ways to favourably exploit cutting-edge technology to support learning and performance together.

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References

Badawi, M. F. (2009). Using blended learning for enhancing EFL prospective teachers' pedagogical knowledge and performance. *Conference Paper: Learning & Language – The Spirit of the Age*, 14-15.

Chen, Z., Cheng, S. C., & Heng, W.J. (2019). *Innovation in Action*. Singapore: Institute for Adult Learning.

Chen, Z., Chia, A., & Bi, X.F. (2019). *Promoting innovative learning at the workplace – a Singapore story*. PAPER PRESENTED AT 11th Research on Work and Learning (RWL) Conference, Giessen, Germany.

Chen, Z., Ramos, C., Phua, L.D., & Cheng, S. C. (forthcoming). *Training and Adult Education Landscape in Singapore: characteristics, challenges and policies.* Singapore: Institute for Adult Learning.

Cheng, S. C., & Chen, Z. (2019). *Quality of adult educators in Singapore: domain and pedagogical proficiency.* PAPER PRESENTED AT 11th Research on Work and Learning (RWL) Conference, Giessen, Germany.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education, *Internet and Higher Education, 7, 95-105.* http://www.anitacrawley.net/Resources/Articles/GarrisonKanuka2004.pdf

Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions, in Bonk, CJ & Graham, CR (eds.), *The Handbook of Blended Learning: Global Perspectives, Local Designs.* Pfeiffer Publishing, San Francisco, California, pp. 4-21.

Herrington, J., Reeves, T.C. & Oliver, R. (2010). *A guide to authentic e-learning, e-book.* Routledge, New York, http://researchrepository.murdoch.edu.au/id/eprint/1903/1/a_guide_to_authentic_learning.pdf.

Hewett, S. (2016). *Engagement and interaction in blended workplace learning: A case study.* Masters by Research thesis, Queensland University of Technology. Downloaded on February 21, 2018 from https://eprints.qut.edu.au/98418/

Hodgkin, C. (2009). CME: From hard reality to virtual reality. *Journal of Medical Marketing, 9* (2), 162-165.

Hoffman, J. (2006). Why blended hasn't (yet) fulfilled its promises, in Bonk, C. J., & Graham, C. R. (eds.), *The Handbook of Blended Learning: Global Perspectives, Local Designs.* Pfeiffer Publishing, San Francisco, California, pp. 27-40.

Hutchinson, V. (2016). *Using digital technologies for adult literacy teaching, learning and assessment*. https://ec.europa.eu/epale/sites/epale/files/using_digital_technology_for_adult_literacy.pdf [viewed 7 June 2017].

Institute for Adult Learning. (2016). Blending *classroom with work and technology: How to design a blended curriculum.* *https://www.ial.edu.sg/content/dam/projects/tms/ial/Find-resources/Learning-resource-and-tools/blended-learningguide/Blended%20classroom%20with%20work%20and%20technology%20(IAL)%201st%20edition%20(1.2).pdf*

Osguthorpe, R. T. & Graham, C. R. (2003) Blended learning systems: Definitions and directions. *Quarterly Review of Distance Education, 4*(3), 227-234.

SkillsFuture. (2017). iN.LEARN 2020. http://www.skillsfuture.sg/inlearn

Zhang, W., & Cheng, Y. L. (2012). Quality Assurance in E-Learning: PDPP Evaluation Model and its Application. *The International Review of Research in Open and Distance Learning, 13*(3).

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