Learning Motivation of Adult Learners During the Transition to Fully Online Learning Due to COVID-19

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Abstract
This paper investigates the learning motivation amongst adult learners in Singapore, during Singapore's transition to fully online learning due to COVID-19. A mixed methods study consisting of two phases was conducted from 2020-2021: (i) Phase One is an online survey which consists of a series of Likert-scaled items that ask respondents to reflect on their most recent online learning experience, which includes their motivation and learning strategies, as well as their perspectives on online learning; (ii) Phase Two is a combination of interviews and focus group discussions to gather information on the respondents' experiences and their collective suggestions. The relationship between their learning motivation and learning strategies with their intention to participate in further online learning was examined using the Technology Acceptance Model (TAM) framework. The findings were supported by the qualitative research conducted in Phase Two of the study. Other key findings indicate that adult learners in Singapore are embracing the fact that online learning is becoming a norm, but some challenges remain. Firstly, there is a need to ensure that both the learners and Adult Educators (AEs) possess the relevant digital skills. Findings also imply that AEs and training providers should pay attention to the following when designing an online learning programme: (i) to allow learners to enjoy the element of social interaction; and (ii) to provide learners with prior support to familiarise with the functions and use of learning platforms.

Keywords: Lifelong Learning, Online Learning, Learning Motivation, COVID-19

Introduction

Singaporeans had been no strangers to online learning long before COVID-19 hit Singapore in 2020. Back in 1997, the Singapore government had launched a 'Master Plan for IT in Education' to enhance teaching and learning through IT and online learning at both the K-12 and tertiary levels (Hung et al., 2003). The adoption of online tools was widespread but slow, and varied in extent. This changed after the SARS outbreak in 2003, during which schools and campuses nationwide were shut down for a week. The education sector in Singapore moved to adapt its business continuity plans after SARS was brought under control, with the installation of learning and content management systems as well as the implementation of 'e-learning weeks', so as to prepare staff and students in the event that such closures were to happen again (Chandran, 2011).

Online learning came with its own challenges, regardless of the length of the online courses. An exploratory study conducted by Guan, Ding and Ho (2015) on the adult learners studying in Institutes of Higher Learning (IHLs) in Singapore found that several factors impact the effectiveness of online learning methods, which helped to informed and improve institutional online learning strategies. These include "technical training for the learners, improved infrastructure by the institution, and the use of localised examples and cases" (cited in Tan & Sheng, 2022). When asked to rank-order critical factors for online learning effectiveness, factors highlighted by the participants include self-discipline, study materials, instructor, network access and stability, their own technical competence, technical support from a helpdesk, as well as their classmates. These experiences are echoed by other studies focused on the challenges that adult learners face in online learning (e.g. Kara et al., 2019). All these imply a need for an improvement of the curriculum and the development of the instructors' capability, especially in areas related to content development and the use of appropriate pedagogical activities for online learning environments.

Besides the challenges, other aspects of online learning such as motivation, self-directed learning capabilities, and support networks were also studied. For example, Regmi and Jones (2020) found that the motivation to learn online was influenced by contextual factors such as time and flexibility in course design, while other studies considered the need to develop self-directed learning (e.g. Manganello, et. al., 2019; Rostaminezhad, et. al., 2013). The relevance of course design and content were also considered when studying the learners' levels of satisfaction with the course, which will also impact motivation and completion rates (Park & Choi, 2009). These factors point to the importance of online learning design. Lastly, interaction and collaboration were also found to be essential for learner success in several other studies (e.g. Kara et al., 2019; Manganello et al., 2019; Regmi & Jones, 2020).

However, these studies were conducted pre-COVID-19 when classroom learning was still the default mode and online learning was an alternative to gradually ease into, which is usually at a minimal level. With the rapid spread of COVID-19 and the ensuing closure of schools globally, learning institutions were pressured to quickly transition all in-person learning activities to fully online learning.

Singapore entered the Circuit Breaker period on 7 April 2020, which lasted for almost two months and was defined by a stay-at-home order to prevent escalating COVID-19 infections. During this period, the Higher Education and the Training and Adult Education sectors were pressured to accelerate their digital transformation as they only had one to two weeks to transit to fully online learning, due to the physical closure of their teaching and training

premises. Much needed to be learnt about the experiences of the learners during this transition.

Aims and Objectives

A variety of rapid snapshot polls and surveys had provided some early insights into the impact of COVID-19 on the education sector, but many have taken the institutional or faculty view (e.g. Grajek, 2020; Chan, 2020). As the unit of analyses was limited to institutes of higher learning and was primarily concerned with students in degree-granting programs, it is uncertain if the findings from these studies are generalizable to the general adult learner. This study filled the gap by looking at adult learners in non-degree online learning activities, such as those in corporate environments. In addition, as online learning proliferates and most professions become increasingly dependent on technological work tools, it is crucial to understand how to improve the use of such technologies for the best outcomes, particularly outcomes pertaining to learning.

In this paper, the following research questions will be addressed:

RQ1: How has the transition to fully online learning due to COVID-19 impacted the adult learners?
RQ2: What are the challenges adult learners experience in their transition to fully online learning due to COVID-19?
RQ3: What motivated learners to continue to participate in online learning?
RQ4: What are the implications of the challenges (or the absence of) from transitioning to fully online learning?

Methodology

A mixed-method research study consisting of two phases was conducted from September 2020 to February 2021 (Figure 1).

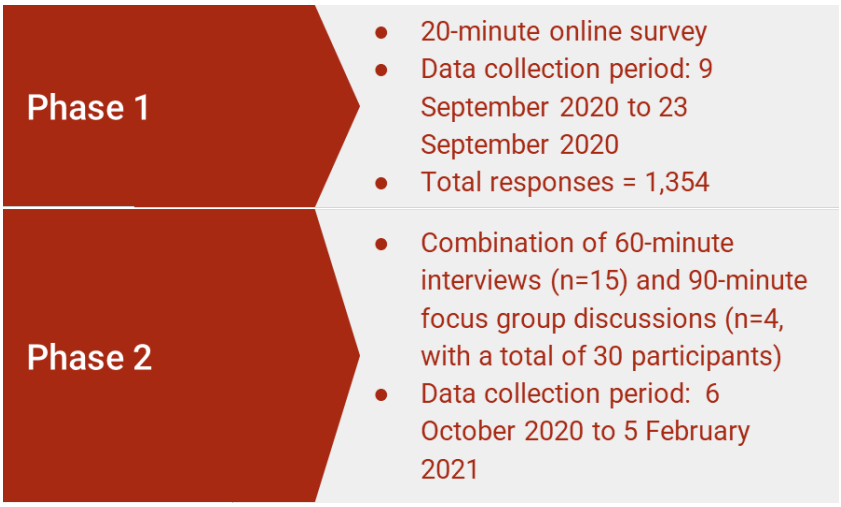

Figure 1: Phases of the study

Phase One comprised a 20-minute online survey (n=1,354) that collected data on adult learners' perceptions of online learning, motivation, experiences, and challenges. The survey included a series of Likert-scaled items that probed participants to reflect on their most recent online learning experience since the implementation of the Circuit Breaker in Singapore on 7

April 2020, their perspectives on online learning, their learning strategies, as well as their learning motivations. Data collection started on 9 September 2020 and ended on 23 September 2020.

Phase Two was a combination of 60-minute interviews (n=15) and 90-minute focus group discussions (n=4, with a total of 30 participants), with a purposive sample drawn from Phase One. Phase Two aimed to gather more in-depth information on adult learners' experiences and their collective suggestions, which included suggestions that could improve potential participation in online learning. Data collection started on 6 October 2020 and ended on 5 February 2021.

The participants were recruited from a combination of sample listings: (i) learners of training programmes conducted by the Institute for Adult Learning (IAL), an institute that provides training for adult educators in Singapore; (ii) past participants of surveys conducted by the research division of IAL; (iii) members of the Adult Education Network (AEN), a community for training and adult education professionals in Singapore to connect, collaborate and learn; and (iv) Continuing Education and Training (CET) students from an autonomous university in Singapore. All individuals aged 21 and above within this sample frame received an invitation via email to participate in the study. A total of 1,354 individuals participated in the study. Table 1 provides a breakdown of the participants.

Sample listing	**Proportion**
Past survey participants	15.1%
IAL Learners	3.2%
Adult Education Network (AEN)	77.8%
SUSS CET students	3.8%
Gender	**Proportion**
Male	57.1%
Female	42.9%
Age	**Proportion**
Below 30	9.8%
30- 39	25.8%
40- 54	45.9%
55 and above	18.6%
Highest Qualification	**Proportion**
Secondary and below	2.9%
Post- secondary	20.5%
Degree and above	76.6%
Employment status	**Proportion**
Employee	65.4%
Self- employed/ Freelancer	21.3%
Unemployed	6.9%
Out of labour force	6.4%

Table 1: Profile of selected interviewees

Key Findings

In this section, we present the keys findings from both phases of the study in response to research questions one to three. The final research question will be addressed in the concluding section of this paper.

Impact of the transition on adult learners: The adult learners in Singapore by and large reported that they accepted that online learning is here to stay. This finding was evident across a range of data and questions, but most clearly indicated in the following survey question illustrated in Figure 2. Over three quarters of the respondents indicated they would continue to learn online.

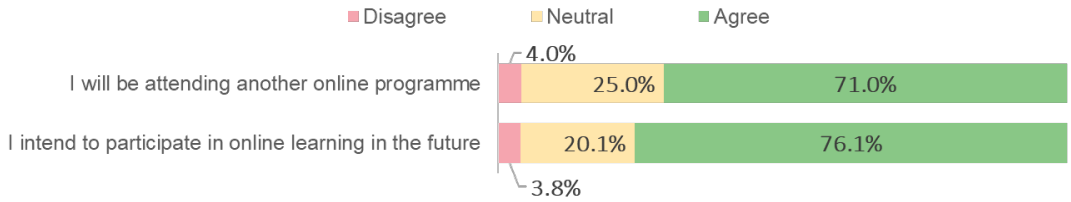

Figure 2: Proportion of adult learners who intend to participate in online learning in the future (%)

There also has been a fourfold increase in the preference for 100% online learning from 5.6% to 26.4% (Figure 3), since the implementation of the Circuit Breaker. At the same time, the preference for blended learning (i.e. programmes combining both classroom and online learning) has risen from 56.9% to 66.6%, while the preference for 100% classroom-based learning has decreased sharply from 37.4% to 7.0%.

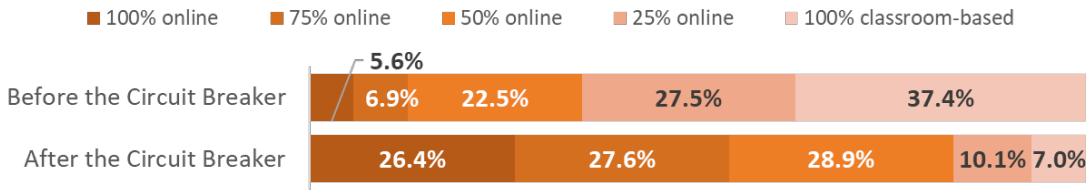

Figure 3: Preferred mode of learning before and after the Circuit Breaker

This finding corroborates another study conducted by the IAL regarding the impact of the move to fully online learning on adult educators (AEs). Among the AEs surveyed in this study, 51% intends to frequently use online platforms for their work even after the pandemic, more than 90% shared that their organisations intend to replace a majority or all of their face-to-face programmes with online offerings in the short-term (i.e. currently to the next year), and 92% felt that the training and adult education sector in Singapore is likely to remain in a predominantly online model in a post COVID-19 world (Tan et. al., 2020).

In terms of the benefits from the transition to online learning, as perceived by the learners, the convenience of online delivery was highlighted in the survey where close to 90% of the respondents liked online learning due to the convenience of not having to travel (Table 2). The convenience was also highlighted by both participants of the focus group discussions (FGD) and the interviewees in phase two of the study. Despite the general preference for face-to-face learning, nearly all the participants in phase two talked about the convenience of doing the courses in the comfort of their own homes. Saving travel time to the training premises meant that they will be able to get more time for self-study:

> …the journey going there and coming back home is three hours, and actually that's my three hours lesson. So, the good thing is I save the time, instead of travelling, I can relook at the lecture and then do my own self-study. (Bryan)

For those engaged in asynchronous learning, the convenience of being able to complete the learning activities at times of their choosing, at their own pace, as well as at a venue of their own convenience meant that they can take breaks whenever they wished. This also ties in with the concept of flexibility, which was brought up by both the survey respondents and interviewees:

> …it's very useful and I miss a certain, like a certain chapter or something I did not understand, I can just go back and re-watch it. (Cherry)

> Flexibility in completing the learning at different times or by breaking the training down into multiple sessions. (survey respondent, 69720)

These benefits imply that including a portion of asynchronous learning within an online learning programme might be a better approach, which is corroborated by data on the effectiveness of the programme as reported by survey respondents (Figure 4). Generally, the majority of the respondents (85.2%) found that the online learning programme that they had attended was effective to some extent, in terms of improving their skills or knowledge. However, it is worth noting that there higher proportion of adult learners who attended programmes with a mixed mode of delivery (i.e. synchronous and asynchronous) reporting that the online learning programme is effective.

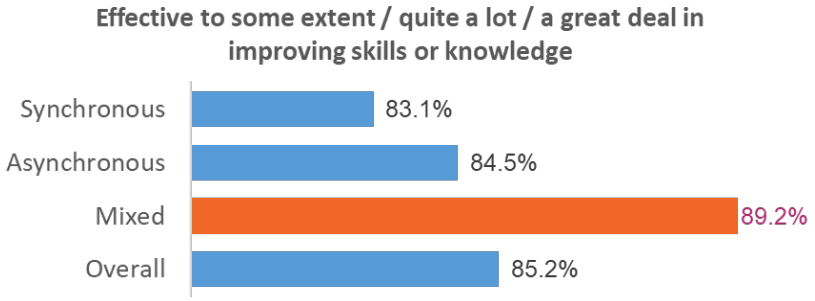

Figure 4: Effectiveness of online learning programme

Lastly, survey respondents also shared that being in a familiar environment made they feel relaxed (Table 2).

It was very convenient because I did not have to travel	87.8%
I felt relaxed because I was in familiar environment	41.5%
I was able to have some face-to-face interactions through video-conferencing	25.6%

Table 2: Top 3 factors that adult learners liked about online learning

While it seems that there is general acceptance among adult learners that online is here to stay, there were considerable challenges for many thus indicating that there is much to be improved.

Challenges: Data from the study illustrates that adult learners experienced considerable technological challenges while learning online. Be it the learners or instructors, discomfort or lack of familiarity with the required technologies or applications used was reported as a technological challenge by more than a quarter of the survey respondents (Figure 5).

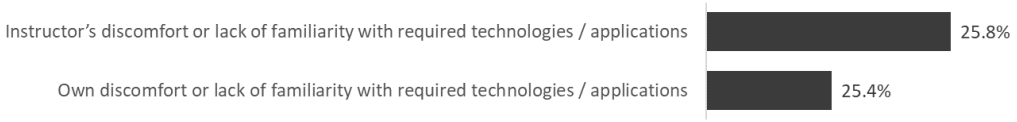

Figure 5: Technological challenges pertaining to technological expertise

In terms of technological infrastructure, more than a quarter of the survey respondents complained that there were inadequate digital replacements for face-to-face collaboration tools (Figure 6), which indicate the lack of such features in currently available learning technologies (and sometimes the lack of instructor's technological expertise to utilise such features). A small but nevertheless worrying proportion of the survey respondents reported limited or no access to a reliable digital device (11.4%) or a required specialised software (16.6%). These are important infrastructure issues that need to be addressed, as they will affect social mobility and widen the gap between the information rich and the information poor.

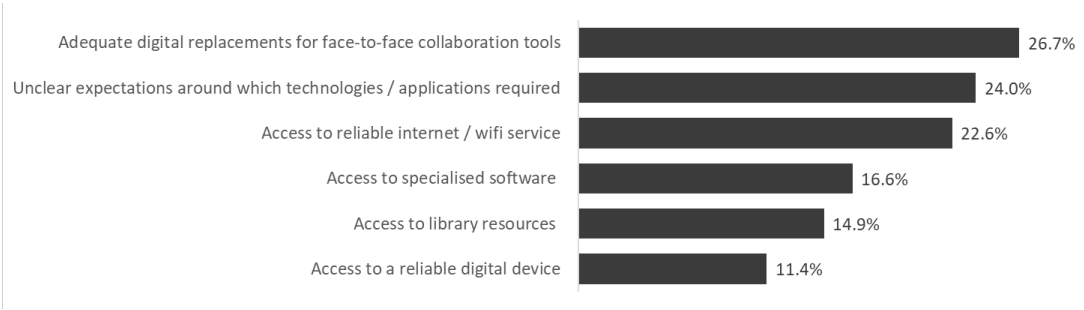

Figure 6: Technological challenges pertaining to technological infrastructure

Design issues pertaining to the lack of interaction and the difficulty to stay focussed or motivated was also high amongst challenges experienced (Table 3). Regardless of the mode of delivery, a concerning number of survey respondents had issues with the lack of interaction between learners (51.0%) and between learner and trainer (43.0%). About 4 in 10 also reported that the course lessons or activities did not translate well with the online environment, mainly for those in synchronous mode.

	Synchronous	**Asynchronous**	**Mixed**	**Overall**
Difficulty focusing on or paying attention to on-screen / online instruction or activities	42.0%	40.5%	40.5%	41.3%
Personal motivation / desire to complete coursework	21.3%	33.1%	23.4%	23.7%
Not being able to see classmates	19.6%	16.9%	18.4%	18.8%
Lack of interaction among classmates	53.7%	44.6%	49.3%	51.0%
Lack of interaction among learners and facilitator / trainer / lecturer	43.3%	45.3%	41.4%	43.0%
Not able to get required attention from the facilitator / trainer / lecturer	17.7%	20.9%	17.1%	18.0%
Course lessons or activities that haven't translated well to a virtual environment	40.1%	35.1%	40.1%	39.4%

Table 3: Challenges pertaining to design issues

Learning Motivation and Strategies: To investigate why learners continue to participate in online learning, this study adapted questions from an oft-researched theoretical model of user acceptance and usage of technology known as the Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989). TAM in its original form suggests that an individual's motivation to use technology is influenced by the perceived ease of use, perceived usefulness, as well as the attitude toward using the system in question. The model posits that perceived ease of use directly influences both perceived usefulness and also the individual user's attitude towards system use (Figure 7). Questions were adapted from the studies conducted by Venkatesh & Davis (2000) and Masrom (2007), and validated with a pilot study.

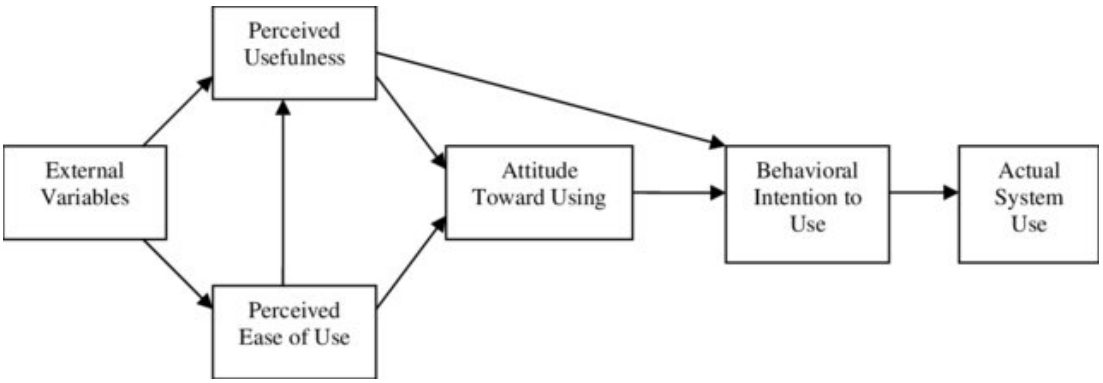

Figure 7: Technology Acceptance Model (Davis, Bagozzi, & Warshaw, 1989)

Generally, respondents gave a good rating for each item of the three TAM dimensions used in this study (Likert-scaled items of 1= "Strongly Disagree" to 5 = "Strongly Agree"), with the mean scores ranging from 3.17 to 4.00 for the individual items. On average, the perceived usefulness of online learning was rated the lowest among the three dimensions.

Perceived ease of use of online learning system		
Ease1	It was easy for me to use the online learning platform	4.00
Ease3	My experience with online learning was effective	3.78
Ease4	I find it easy to find information through online learning	3.79
Ease5	I find it easy to learn what I want to learn from online learning	3.72
Perceived usefulness of online learning		
Use2	I learn better through online learning	3.17
Use3	Participating in online learning improved my learning performance	3.34
Use4	Participating in online learning increased my productivity in my learning	3.40
Use5	I found online learning useful	3.76
Attitude towards online learning		
ATT1	I like the idea of using online learning	3.81
ATT2	I have a generally favourable attitude toward using online learning	3.78
ATT3	I believe it is a good idea to use online learning for my learning	3.81

Figure 8: Mean scores for TAM items

On the other hand, questions on learning motivation and learning strategies were adapted from the study conducted by Lee et. al. (2019). Respondents generally rated lower in terms of collaboration with their classmates (Likert-scaled items of 1= "Never" to 5 = "Always"), as compared to the other two dimensions (Likert-scaled items of 1= "Strongly Disagree" to 5 = "Strongly Agree").

	Learning motivation	
Mot1	Online classes enhance my interest in learning	3.51
Mot2	I am motivated to study when I take an online class	3.40
Mot3	Online classes are very useful to me	3.71
Mot4	It is very interesting to take online classes	3.59
Mot5	After taking an online lesson, I look forward to the next one	3.48
	Self-directed learning	
PS1	I was able to derive new interpretations and ideas from the knowledge I have learned	3.69
PS2	I was able to approach the subject of the class with a new perspective	3.71
PS3	I was able to deeply analyse thoughts, experiences, and theories about the knowledge I have learned	3.61
PS4	I was able to judge the value of the information related to the knowledge learned	3.70
PS5	I tend to apply the knowledge I have learned to real problems or new situations	3.79
	Collaboration with classmates	
Collab1	I tried to answer the questions that other students asked	3.19
Collab2	I tried to solve difficult problems with other students when I encountered them	3.20
Collab3	I worked with other students on online projects or assignments	3.16
Collab4	I studied the lesson contents with other students	2.75
Collab5	I asked other students for help when I couldn't understand a concept taught in my online class	2.94
Collab6	I made use of online chat groups like Whatsapp, Telegram to communicate with other students	3.48

Figure 9: Mean scores for learning motivation and strategies

Two logistic regression models were employed, one to investigate the relationship between learning motivation and learning strategies with the intention to participate in online learning in the future, the other to examine the impact of these factors on the effectiveness of online learning i.e. an improvement in skills and knowledge; TAM dimensions were included in both models. The outcome variables were recoded into a dichotomous variable – for intention to participate in online learning in the future, a reported intention to participate in future online learning (at least 4 on a Likert scale of 1 = "Strongly disagree" to 5 = "Strongly agree") is recoded as "1" and no intention was recoded as "0"; for effectives of online learning, a reported improvement in skills and knowledge at least to some extent (at least 3 on a Likert scale of 1 = "Not at all" to 5 = "A great deal") is recoded as "1" and no improvement was recoded as "0".

Figure 10 shows the odds ratios of the logistic regression models that were run. Adult learners employing learning strategies such as self-directed learning or collaboration with classmates in their learning, are more likely to report that their participation in the online learning programme helped them in improving their skills and knowledge. However, those with better attitudes towards online learning are less likely to report that the online learning programme was effective in improving their skills and knowledge.

On the other hand, those with better attitudes towards online learning and higher learning motivation are more likely to pursue online learning in the future. Although insignificant, collaboration with classmates had a negative impact on the intention to pursue future online learning, which may imply that current experiences of online learning might be lacking in terms of interaction with classmates, as supported by the challenge shared by more than half of the survey respondents regarding the lack of interaction among classmates (Table 3).

Perceived ease of use of the online learning system and the perceived usefulness of online learning have significant impact on both the effectiveness of online learning and intention to pursue further online learning in the future.

	Effectiveness[a]			Intention to pursue further online learning[a]		
	OR	95% CI		OR	95% CI	
Scale						
Learning motivation	0.94	0.61	1.46	1.88*	1.16	3.03
Collaboration with classmates [Learning Strategy]	1.47**	1.16	1.86	0.85	0.66	1.10
Self-directed learning [Learning Strategy]	2.03**	1.31	3.13	1.23	0.77	1.97
Perceived ease of use [Technology Acceptance Model]	2.17**	1.52	3.10	2.02**	1.35	3.02
Perceived usefulness [Technology Acceptance Model]	2.00**	1.28	3.15	1.93**	1.20	3.11
Attitude towards online learning [Technology Acceptance Model]	0.58**	0.39	0.87	5.89**	3.83	9.04
N	939			1,047		
Pseudo R^2	0.18			0.45		

[a]The analyses controls for age, gender, ethnicity, highest qualification attained, and employment status.

*p < .05 **p < .01

Figure 10: Logistic regression results

Conclusions and Recommendations

Due to the sudden transition to fully online learning during the Circuit Breaker, many training providers in Singapore were insufficiently prepared to provide for a smooth experience for both learners and trainers. As shared in the previous section, about 4 in 10 reported that the training activities were not translated well to a virtual environment – many were transited from classroom to online wholesale using available applications such as Zoom and Microsoft Teams, which do not fully meet the needs of conducting online courses. Additionally, many AEs lack the experience in online teaching and therefore use inappropriate learning design. This resulted in the following issues when they face learners with varying levels of technological capability: (i) lack of engagement; (ii) lengthy lessons; and (iii) lack of support for learners with technical difficulties.

There also seems to be an expanded role for AEs. Firstly, they must now also play the role of a fluent user of the technologies that are required for online learning, and exploit the various functions available within the systems to conduct their courses and engage their learners. They also now need to be curators of asynchronous learning, in order to shorten the synchronous lessons and provide the learners with the flexibility in the time and pace at they learn (Tan et. al., 2021). Next, they need to become 24/7 facilitators for learners, by providing technical support or pre- and post- lesson tutorials on the use of the required technologies for learners who less tech-savvy. Lastly, they need to be innovators of facilitation and delivery, so as to devise strategies to maintain the attention and engage their learners, as it becomes more challenging in a virtual environment due to the various challenges highlighted in the previous section.

The findings from this study have provided useful insights on how to sustain the transition to online learning after the COVID-19 pandemic, by addressing the challenges that have been identified. The fact that both the perceived ease of use (of the online learning system) as well as the perceived usefulness of online learning have significant impact on both the effectiveness of online learning and one's intention to pursue further online learning, also highlights the importance of improving the learner's experience and design of the learning system and the course, in order to sustain online learning post-pandemic.

Moving forward into the future where online learning will be the norm, there is a need for the following main areas to be improved: (i) the online learning system, (ii) the learners'

experience; and (iii) the trainers capability and learning design (Tan et. al. 2021). To tackle these, we have made the following recommendations:

1) There is a need for providers to adopt an intuitive Learning Management System that covers all training needs. While the urgency to switch to fully online learning during the Circuit Breaker may have robbed training providers of the time to make proper adjustments to their courses (especially for organisations that do not already offer online learning programmes), it is important that necessary time, talent, and infrastructure should now be allocated to digital transformation in preparation for the expected permanent shift to online learning. One key step for them to take in order to stay sustainable in the sector and the future economy will be to make long-term investments in innovative teaching and learning technologies and methods, so as to improve their courses and the delivery of these courses for better learner experiences and learning outcomes (Tan et. al., 2020). A good solution would be a one-stop learning platform for learners, which minimises the need for learners to locate information from different sources (Tan et. al., 2021). In addition, extra support should be provided for learners with low technological capability during the use of the system, and the AEs' technological capability should be strengthened via continuing professional development.

2) There is a need to help learners to adapt to online learning. Firstly, ensuring that the learners possess the relevant digital skills should be a key focus. There should be more effort and initiatives by the government to help adults (especially the seniors) in Singapore take the digital leap and gain basic digital skills (Tan & Sheng, 2021). Other support that can be provided to the learners include the creation of online learning communities for learners to make connections with fellow online learners, providing opportunities for active social interaction, providing guidelines on how to develop a time-management strategy, and providing physical classroom and resources for individuals who lack access to technological equipment or internet access (Tan et. al, 2021).

3) The quality of design and facilitation of online learning should be improved. Some ways to improve this include striking a balance between synchronous and asynchronous mode of learning so as to provide learners with the flexibility that they enjoy about asynchronous learning, planning for hybrid mode of delivery as there is increasing preference for this, sharing of resources and best practices among the AEs, and lastly setting clear expectations on learner participation, the use of the online platform, and timeline (Tan et. al., 2021).

Delay in the release of the initially planned sample frame (owing in part to data protection policies) caused the pool of participants to be heavily skewed with a high proportion of AEN members (61.9% of the 1,702 respondents) who tended to be highly educated professionals. This caused a high proportion of the respondents with a highest qualification of degree and above (61.1%), as opposed to the national proportion (among Singapore residents aged 25 years and over) of 33.0% in 2020 (Department of Statistics Singapore, 2021). Given the sample in this study (online learners who are for the most part well educated professionals), some of the findings from this study are perhaps not surprising. Findings may be skewed due to the lack of representativeness of the sample, and the generalisability of the findings to the general adult learner in Singapore may be limited. Any follow-up studies must therefore ensure more representation from other learner profiles and backgrounds, in order to address the current limitation of this study and provide a more rounded picture.

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