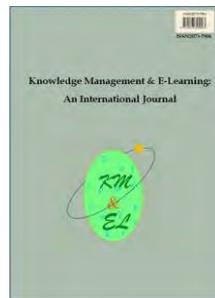

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undergraduates and its implications**

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Future preferred mode of learning of business undergraduates and its implications

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Abstract: e-Learning was abruptly adopted in many countries to mitigate the adverse consequences of the sudden closure of institutions of higher learning caused by the COVID-19 pandemic. Against this background, this study investigated how business undergraduates want to learn in the future and predictors of their future preferred mode of learning. 251 business undergraduates from a private university in Malaysia participated in an online survey conducted in July 2020, during the sudden closure of institutions of higher learning. Data collected were analysed using the multiple discriminant analysis to develop a characteristics profile of the three groups of business undergraduates (i.e., preferred fully conventional classroom learning, blended learning and fully e-learning) in terms of important predictors. Results revealed that the significant predictors of future preferred mode of learning of business undergraduates, in descending order, were disadvantages of e-learning, advantages of e-learning, self-regulated learning, learning outcomes, information and communications technology infrastructure and training, support and resources. This study concludes with some reflective thoughts about important lessons learned from this unprecedented pandemic pertaining to e-learning readiness to deal with future unexpected crises.

Keywords: Covid-19 pandemic; Higher education; e-Learning; Blended learning; Future crisis preparedness; Discriminant analysis

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1. Introduction

The outbreak of the Coronavirus disease 2019 (COVID-19) caused major disruptions to many industries, including education. The tertiary education industry responded swiftly to this crisis by switching from conventional classroom learning to e-learning as an alternative mode of learning. Consequently, although classes were disrupted, learning remained undisrupted (Huang et al., 2020). Discontinuity of education during a crisis has long-term dire consequences (Cheong, Filippou, Cheong, Vesty, & Arity, 2021). This academic continuity appeared to produce a win-win situation during this crisis: undergraduates can continue their education and private institutions of higher learning (IHL) are able to retain existing undergraduates and recruit new undergraduates.

Therefore, IHL can maintaining their financial resources (Holzweiss, Walker, Chisum, & Sosebee, 2020).

Advancement in information and communications technology (ICT) facilitated new methods of learning, allowed access to e-learning and enhanced learning. Prior to the COVID-19 pandemic, many IHL were already practising e-learning to a certain extent, such as using learning management systems, emails, social media, et cetera to deliver learning contents and communicate with undergraduates. E-learning is defined as applying ICT to learn in synchronous and/or asynchronous environments (Huang et al., 2020). In synchronous e-learning, classes are scheduled and conducted in live virtual setting. Under this setting, learners benefit from real-time interactions, instant messages and feedback. In asynchronous e-learning, learning contents are provided via learning management systems or online platforms but there are no live virtual classes (Huang et al., 2020).

Effective e-learning should be well-planned (Hodges, Moore, Lockee, Trust, & Bond, 2020). The unplanned switch from conventional classroom learning to e-learning during a crisis provided the opportunity to research the challenges encountered by learners (Cheong et al., 2021). In contrast to existing literature on the adoption of e-learning underpinned by choice, for example, the Technology Acceptance Model (Davis, 1989), learners' response to e-learning during the sudden closure of institutions of learning may be characterised by a different sequence of events, which begun with the sudden closure of institutions of learning and learners were forced to use e-learning. In the process, they perceived ease of use and perceived usefulness of e-learning, formed attitudes towards e-learning and future intention to use e-learning. The first research question is, after this sudden, involuntary and disruptive shift in learning modality, what is the future preferred mode of learning from the perspectives of undergraduates having experienced the benefits and barriers of e-learning? Will undergraduates abandon e-learning after their IHL reopen or do they prefer fully e-learning or a combination of conventional classroom learning and e-learning (i.e., blended learning)? The second research question is, what are the predictors of future preferred mode of learning of undergraduates? New waves and new variants of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continue to emerge as warned by the World Health Organisation (WHO) and United Nations which will seriously disrupt the delivery of education in the future. The third research question is, how can IHL prepare for future crises and simultaneously craft an education experience that matches how undergraduates want to learn in the future?

2. Literature review

The unprecedented scale and rapid adoption of e-learning during the sudden closure of institutions of learning pose enormous challenges in terms of technical and human aspects (Choong, 2020; Crawford et al., 2020; Reimers & Schleicher, 2020; UNESCO, 2020a, 2020c). A review of recent literature suggests the following challenges in e-learning, especially during the sudden closure of institutions of learning.

2.1. ICT infrastructure for e-learning

ICT equipment (hardware such as desk top computer, laptop, tablet or smart phone and software) and good internet connection are paramount pre-requisites for e-learning (Abbasi, Ayoob, Malik, & Memon, 2020; Almaiah, Al-Khasawneh, & Althunibat, 2020;

Choong, 2020; Wang, Cheng, Yue, & McAleer, 2020). However, digital divide creates inequities of access to ICT equipment and internet connection (Almaiah et al., 2020), leading to a loss of educational opportunities (Choong, 2020; Wang et al., 2020; World Health Organization, 2020; Zhou, Wu, Zhou, & Li, 2020) for learners from poor families or those living in remote or rural areas (i.e., socioeconomically disadvantaged learners).

2.2. Technical training, technical support and resources for e-learning

e-Learning can be based on a variety of software and learning management systems, raising serious technical challenges or technophobia of e-learning (Choong, 2020; Wang et al., 2020). Although learners may be known as the digital generation, they may lack digital skills especially related to e-learning (UNESCO, 2020c). As such, learners should attend online trainings on e-learning tools, and techniques as well as receive guidance for self-directed e-learning (Reimers & Schleicher, 2020; Zhou et al., 2020) prior to e-learning classes. Another critical challenge in switching to e-learning is resistance to change as learners prefer conventional learning methods (Almaiah et al., 2020). Training programmes and technical support can alleviate learners' resistance to change.

e-Learning can fail as a result of the lack of technical support, such as unavailability of technical staff and lack of support to perform various e-learning auxiliary activities such as installation, operation, maintenance, network administration and security (Almaiah et al., 2020; UNESCO, 2020b; Zhou et al., 2020). Lastly, sufficient e-learning resources is critical for e-learning (Almaiah et al., 2020; Zhou et al., 2020).

2.3. Self-regulation for e-learning

e-Learning is a learner-centric modality (Zayapragassarazan, 2020; Zhou et al., 2020). This autonomous learning modality (Reimers & Schleicher, 2020; UNESCO, 2020c; Zhou et al., 2020) emphasises learners' self-regulated learning (SRL) ability (Mou, 2021). SRL is defined as the degree to which learners are metacognitively, motivationally and behaviorally active in their learning processes (Zimmerman, 2013). To put it differently, learners master their own learning processes (Zimmerman, 2011).

Prior study suggests that self-regulation is more difficult in e-learning than in conventional classroom learning (Barnard-Brak, Paton, & Lan, 2010). Biwer et al. (2021) identified four profiles of learners based on their e-learning adaption strategies. The adapters valued the autonomy proffered by e-learning and self-regulate their e-learning. Thus, adapters were likely to prefer e-learning. Conversely, the overwhelmed and surrenderers were less able to regulate their effort, attention, and time and will be less motivated to use e-learning.

2.4. Actual or perceived advantages of e-learning

With e-learning, learners can study anywhere and anytime (24/7) as long as there is access to ICT equipment and internet, breaking the limitations of study space and time (Zhou et al., 2020). In other words, e-learning offers flexibility (Abbasi et al., 2020; Weldon, Ma, Ho, & Li, 2021; Zayapragassarazan, 2020; Zhou et al., 2020) and better control over one's learning environment (Abbasi et al., 2020). This "learner-centric" education model offers rich learning choices and allows learners to take more responsibility for their own learning (Zayapragassarazan, 2020), resulting in improved

learning effectiveness and efficiency (Almaiah et al., 2020; Reimers & Schleicher, 2020) and enhanced higher-order thinking skills, such as questioning, creativity and problem solving (UNESCO, 2020b).

2.5. Actual or perceived disadvantages of e-learning

The sudden, involuntary and disruptive adoption of e-learning may induce learners to feel overloaded and confused (UNESCO, 2020b). Because learners were unprepared for e-learning, they suffered negative outcomes, such as disengagement with learning contents (Day, 2015; Regehr, Nelson, & Hildyard, 2017), faced difficulties in meeting academic demands (Jarrell, Dennis, Jackson, & Kenney, 2008), resulting in a higher probability of dropping out (Jarrell et al., 2008; SchWeber, 2008). Furthermore, disruptions resulting from the COVID-19 pandemic imposed mental and financial distresses on learners (Choong, 2020; UNESCO, 2020a). Learners with deficiencies in motivation and self-regulation will most likely suffer stress and depression, and without strong social support, will be susceptible to burnout, eventually give up e-learning and drop out from the course or university (Choong, 2020; UNESCO, 2020a). The sudden closure of institutions of learning, notwithstanding e-learning, reduces learner-lecturer interaction (Abbasi et al., 2020; Choong, 2020), creates a physical and psychological separation and distance (UNESCO, 2020c), amplifies a sense of disengagement (UNESCO, 2020c) and social isolation (Abbasi et al., 2020; UNESCO, 2020a).

2.6. Learning outcomes

Using e-learning, learning outcomes must be achieved (UNESCO, 2020c), albeit not at the same level as conventional classroom learning due to challenges posed by the sudden, involuntary and disruptive adoption of e-learning. Achieving learning outcomes was found to enhance learners' future preference for e-learning (Looi, Wye, & Abdul Bahri, 2022). Given the context of this study, which is e-learning in Malaysian IHL, this study adopted the five clusters of learning outcomes developed by the Malaysian Qualifications Agency (MQF, 2017), namely, knowledge and understanding, cognitive skills, functional work skills (i.e., practical, interpersonal, communication, digital, numeracy, leadership, autonomy and responsibility), personal and entrepreneurial skills, and ethics and professionalism.

2.7. Demographic and socioeconomic status

The COVID-19 pandemic has varying impacts on individuals, contingent upon their demographics and socioeconomic status, with female learners and learners from lower socioeconomic status likely to be affected disproportionately (Santomauro, Herrera, Shadid, et al., 2021; World Health Organization, 2020). Female learners suffered disproportionately due to existing health and social inequality in many countries, exacerbated by pandemic measures (Santomauro et al., 2021). Socioeconomically disadvantaged learners, for example, from lower income households (Crawford et al., 2020) or residing in rural or remote areas (Almaiah et al., 2020) will be particularly affected by fully e-learning due to the sudden closure of institutions of learning because they do not have access to ICT equipment and sufficiently good internet connection. In addition, some learners may not have a quiet space to study at home or may be distracted by family responsibilities. These learners will likely suffer a higher risk of being left behind in e-learning (Choong, 2020).

3. Method

3.1. Participants

This study was approved by the Research Ethics Committee of Xiamen University Malaysia (REC-2005.02). This study selects a narrowly defined sample (Davidsson, 2004), that is, full time undergraduates majoring in business from a private university in Malaysia who normally attend conventional classroom learning prior to the sudden closure of the university.

3.2. Measurement

Ex ante procedural remedies in design and administration of the questionnaire were employed to reduce common method variance (Chang, van Witteloostuijn, & Eden, 2010). At the beginning of the questionnaire, participants were assured anonymity and confidentiality of their responses, that there are no correct or incorrect answers and that they should answer as honestly as possible. Moreover, there are no questions that would provoke defensiveness or threaten esteem.

The questionnaire is in English and consists of two parts. Part A collected data on demographics and socioeconomic status, such as gender, household income (bottom 40% or B40, with monthly household income of below Ringgit Malaysia 4,850; middle 40% or M40, with monthly household income of between Ringgit Malaysia 4,850 and Ringgit Malaysia 10,959; top 20% or T20, with monthly household income of Ringgit Malaysia 10,960 or higher) (Department of Statistics, Malaysia, 2020) and location of residence (rural, semi-urban or urban area). This study utilised quasi-experimental designs (Becker, 2005; Bernerth & Aguinis, 2016) to eliminate the effects of confounding variables. Confounding variables not related to the theories being examined (Atinc, Simmering, & Kroll, 2012; Carlson & Wu, 2012; Spector & Brannick, 2011), such as level of study, major or area of specialisation, fully e-learning during the online survey are made uncorrelated with future preferred mode of learning by holding them constant across samples (Atinc et al., 2012; Becker, 2005; Bernerth & Aguinis, 2016).

Part B collected data on metric predictors/factors and future preferred mode of learning. Underpinned by recent literature, the metric predictors/factors were operationalised into items reflective of each metric predictor/factor (Churchill, 1979). Multi items were used to ensure that there were no priming and no overlapping of questions for different predictors/factors (Spector & Brannick, 2011). The ICT infrastructure factor was measured by five items (sample item: "I have access to a laptop, personal computer, tablet or smart phone for e-learning"). The training, support and resources factor was measured by six items (sample item: "I attended online trainings to make the best out of e-learning"). The self-regulated learning factor was measured by six items (sample item: "I maintained good learning habits, including hours of self-learning before and during e-learning"). The actual or perceived advantages factor was measured by six items (sample item: "E-learning is more flexible because there is no limitation in terms of time and space (24/7 learning)"). The actual or perceived disadvantages factor was measured by six items (sample item: "Using e-learning, I feel socially isolated"). The learning outcomes factor was measured by eight items (sample item: "Using e-learning, I am able to effectively learn the subject knowledge"). The response scale for all items was Likert type, ranging from strongly disagree (1), disagree (2), neutral (3), agree (4) to strongly agree (5). The future preferred mode of learning was measured by three nominal

categories: fully conventional classroom learning, blended learning (i.e., combination of conventional classroom learning and e-learning) and fully e-learning.

3.3. Data collection procedures

This survey was conducted in July 2020 when this private IHL was closed and practised fully e-learning for all courses for the first time. Link to the self-administered online questionnaire hosted on Google Forms was distributed to approximately 300 business undergraduates via email. Participation in this survey was on a voluntary basis. This study followed standard survey approaches to minimise response biases, that is, no social pressure to influence responses and no payoff or cost for particular responses. Participants gave their online consent to participate by clicking the “Next” button and proceed to answer this online questionnaire. 255 completed questionnaires were received at the end of the data collection period.

3.4. Data analysis

Data in Excel format were downloaded from Google Forms, recoded into numeric format and transferred into the Statistical Package for the Social Sciences (SPSS) version 26. Preliminary data analysis checked normality, outlier and examined common method bias for variance attributable to the measurement instrument. Next, the psychometric properties of reliability and validity (convergent and discriminant) for all factors were checked via the Cronbach’s alpha and the exploratory factor analysis (EFA), respectively.

To answer the research questions, this study developed discriminant functions to discriminate future preferred mode of learning of business undergraduates. The discriminant analysis is similar to the multiple regression analysis, except that the dependent variable in discriminant analysis is categorical. To estimate the discriminant functions (i.e., the linear combinations of the predictors) that best discriminate between the groups of future preferred mode of learning, future preferred mode of learning was selected as grouping variable (i.e., dependent variable). As the discriminating power of these predictors/factors was unknown, the direct method was used. Thus, gender, household income, location of residence, ICT infrastructure, training, support and resources, SRL, advantages, disadvantages and learning outcomes were entered simultaneously as predictors.

4. Results

4.1. Preliminary data analysis, demographics and socioeconomic status of participants

Four unqualified participants were deleted from the data, leaving 251 qualified participants. Initially, data were checked for normality using the normal Q–Q plot and results suggested that there is no serious violation. Thus, the use of the discriminant analysis is justified. Furthermore, there is no serious threat of outlier in the data. All Cronbach’s alphas were above 0.7, indicating reliability of metric predictors/factors. The results of the Kaiser-Meyer-Olkin measure of sampling adequacy and the Bartlett’s test of sphericity indicated appropriateness of factor analysis. In the exploratory factor analysis, using the principal component analysis and the varimax rotation method, seven components/factors were extracted – consistent with a priori theorising – accounting for

68% of total variance explained. Thus, the ex post statistical remedy of Harman one factor analysis indicated that variance in the data is not largely attributed to a single factor (i.e., absence of common method bias). All items were correctly loaded onto their respective theorised metric predictors/factors, suggesting convergent and discriminant validity, except thinking skills (originally conceptualised as an item under advantages) and social isolation (originally conceptualised as an item under disadvantages). Consequently, these two items were excluded from subsequent analysis. The cross-tabulation of gender, household income and location of residence is presented in Table 1.

Table 1
Cross-tabulation of gender, household income and location of residence

Household income	Location of residence	Gender		Total (n = 251)
		Male (n = 89)	Female (n = 162)	
B40	Rural area	0	6	6
	Semi-urban area	3	13	16
	Urban area	5	10	15
	Sub-total	8	29	37
M40	Rural area	5	8	13
	Semi-urban area	31	40	71
	Urban area	20	33	53
	Sub-total	56	81	137
T20	Rural area	1	1	2
	Semi-urban area	12	27	39
	Urban area	12	24	36
	Sub-total	25	52	77
Total	Rural area	6	15	21
	Semi-urban area	46	80	126
	Urban area	37	67	104
	Total	89	162	251

4.2. Future preferred mode of learning and discriminant analysis

In terms of future preferred mode of learning, 69 (28%) of business undergraduates preferred fully conventional classroom learning, 144 (57%) preferred blended learning and 38 (15%) preferred fully e-learning.

The discriminant analysis generated characteristics profile of each group of business undergraduates (preferred fully conventional classroom learning, blended learning and fully e-learning) in terms of the group means for the predictors (Table 2). The three groups of business undergraduates have almost similar characteristics in terms of household income, location of residence and gender. However, learners who preferred fully e-learning seemed to score highest on all metric predictors/factors (lowest on disadvantages) as theorised.

The tests of equality of group means (Table 3) revealed that there were no significant differences in terms of household income, location of residence and gender among the three groups, consistent with observations from the characteristics profile. However, there were significant differences in group means for all metric predictors. The correlations between predictors were low, indicating that multi-collinearity is not a serious problem. Thus, justifying the use of discriminant analysis.

Table 2
Characteristics profile

Predictors	Future preferred mode of learning		
	Fully conventional classroom learning (n = 69, 28%)	Blended learning (n = 144, 57%)	Fully e-learning (n = 38, 15%)
Household income	2.1	2.2	2.1
Location of residence	2.3	2.3	2.3
Gender	1.6	1.6	1.7
ICT infrastructure	3.6	4.1	4.4
Training, support & resources	3.1	3.4	3.7
SRL	2.8	3.3	3.9
Advantages	3.0	3.6	4.1
Disadvantages	3.8	3.2	2.6
Learning outcomes	2.6	3.1	3.6

Table 3
Tests of equality of group means

Predictors	Wilks' Lambda	<i>F</i>	<i>df1</i>	<i>df2</i>	Sig.
Household income	.992	.955	2	248	.386
Location of residence	.999	.145	2	248	.865
Gender	.996	.436	2	248	.647
ICT infrastructure	.877	17.432	2	248	.000
Training, support & resources	.936	8.469	2	248	.000
SRL	.848	22.208	2	248	.000
Advantages	.844	22.908	2	248	.000
Disadvantages	.766	37.906	2	248	.000
Learning outcomes	.861	20.018	2	248	.000

Two discriminant functions were estimated (Table 4). Function 1 has a larger eigenvalue, which imply a superior function. The square of canonical correlation indicated that 34% of variation in future preferred mode of learning is accounted for by function 1. The null hypotheses are that the means of all discriminant functions in all groups (i.e., group centroids) are equal. The discriminant functions estimated for functions 1 and 2 were statistically significant based on Wilks' Lambda (Table 5). However, when function 1 is excluded, function 2 is not significant. In other words, only function 1 is significant. Thus, the null hypothesis for function 1 was rejected, indicating significant discrimination. Because function 2 is not significant, it was not interpreted henceforth.

Table 4
Eigenvalues

Function	Eigenvalue	% of variance	Canonical correlation	Square of canonical correlation
1	.503	95.6	.579	.34
2	.023	4.4	.151	.02

Table 5
Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.650	105.081	18	.000
2	.977	5.649	8	.687

In the structure matrix (Table 6), all metric predictors were primarily associated with function 1, whereas demographics and socioeconomic status were predominantly associated with function 2. For each function, the predictors were ordered by their absolute magnitude. In other words, the predictor with the largest coefficient is disadvantages for function 1 and household income for function 2. The group centroids give the value of the discriminant function evaluated at group means. Business undergraduates who preferred fully conventional classroom learning have the lowest value on function 1, whereas business undergraduates who preferred fully e-learning have the highest value on function 1 and business undergraduates who preferred blended learning have a positive albeit small value on function 1 (Table 7). These values indicated good separation among the three groups on function 1 and were visualised in Fig. 1. The evaluation of accuracy of classification shows improvement over chance ranging from 17% to 29% (Table 8). The overall percentage of classification accuracy of cases (i.e., hit ratio) is 69% and attests to the validity of the discriminant analysis.

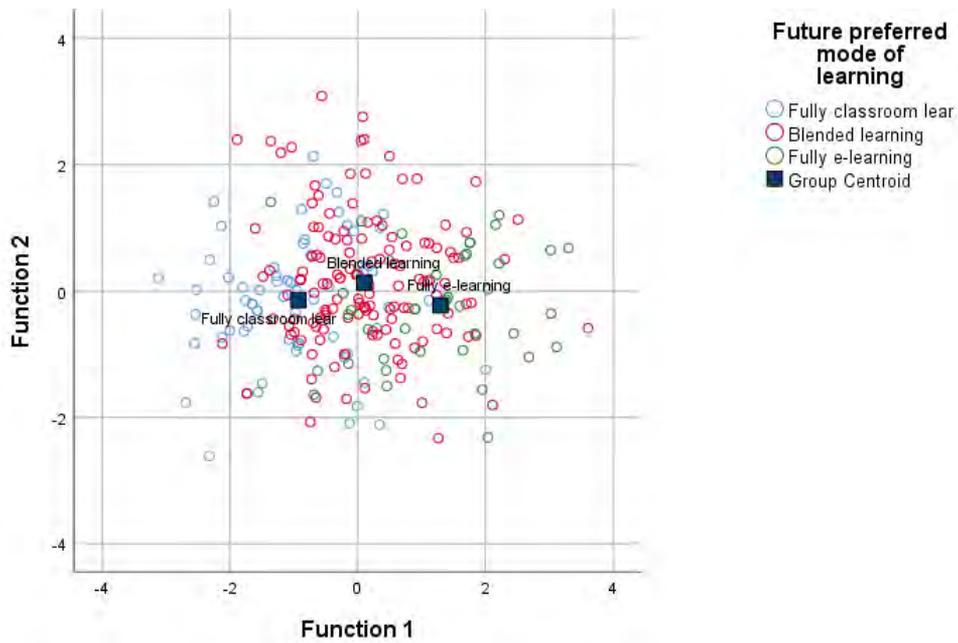


Fig. 1. Canonical discriminant functions

Table 6
Structure matrix

	Function1	Function 2
Disadvantages	-.779*	-.031
Advantages	.596*	.324
SRL	.593*	-.298
Learning outcomes	.566*	.099
ICT infrastructure	.522*	.378
Training, support & resources	.365*	.230
Household income	.006	.573*
Location of residence	-.013	.215*
Gender	.076	-.165*

Note. * Denotes largest absolute correlation between each variable and any discriminant function

Table 7
Functions at group centroids

Future preferred mode of learning	Function 1
Fully conventional classroom learning	-.928
Blended learning	.102
Fully e-learning	1.96

Table 8
Classification results

Future preferred mode of learning	Prior probability	Classification results	Improvement
Fully conventional classroom learning	.275	.449	.174
Blended learning	.574	.861	.287
Fully e-learning	.151	.368	.217

5. Discussion

The first research question was how undergraduates want to learn in the future? Despite the various challenges accompanying the sudden and involuntary switch to e-learning, 57 per cent of business undergraduates surveyed preferred blended learning in the future. This finding corroborated with finding by the PROJECT ID (2021) that 58 per cent of learners preferred blended learning in the future. Moreover, it is consistent with finding by Chegg.org (2021) that 48 per cent of learners preferred more e-learning components in their courses after institutions of learning reopen. Taken together, these findings shed light on learners' future preference for blended learning. It appeared that the involuntary adoption of e-learning has significantly lowered the psychological barriers to e-learning of learners (Govindarajan & Srivastava, 2020). As undergraduates become acquainted with e-learning, they realised the advantages of combining both modalities for their future learning experiences. As such, IHL should start designing better learning experiences for undergraduates by incorporating more e-learning components into their conventional classroom learning. This suggestion will be elaborated when discussing the third research question.

The second research question was what are the predictors of future preferred mode of learning of undergraduates? This study developed discriminant functions to discriminate future preferred mode of learning of business undergraduates. On the whole, the findings supported the hypotheses – except household income, location of residence and gender – suggesting that the metric predictors/factors, in descending order (Table 6) of disadvantages, advantages, SRL, learning outcomes, ICT infrastructure and training, support and resources, significantly predicted future preferred mode of learning of business undergraduates. From Table 2, business undergraduates who preferred fully conventional classroom learning scored highest on disadvantages of e-learning (3.8) but lowest on SRL (2.8) and learning outcomes (2.6). Business undergraduates who preferred fully e-learning scored highest on ICT infrastructure (4.4), advantages of e-learning (4.1) and SRL (3.9) but lowest on disadvantages of e-learning (2.6). Therefore, this study predicts that business undergraduates who perceived many disadvantages of e-learning, lacked SRL and achieved lower learning outcomes using e-learning preferred fully conventional classroom learning. On the other hand, business undergraduates with good access to ICT infrastructure, perceived advantages of e-learning, possessed strong SRL and perceived fewer disadvantages of e-learning preferred fully e-learning.

IHL need to urgently mitigate challenges faced by business undergraduates who preferred fully conventional classroom learning during the sudden closure of IHL. Given that e-learning was abruptly adopted as an educational response to the sudden interruption of education delivery caused by the COVID-19 pandemic, it is tenable that many business undergraduates were unprepared when using fully e-learning for all courses for the first time. The actual or perceived disadvantages of e-learning – which include lack of interaction with lecturers and other learners, feeling overloaded, confused, stressed, wanting to give up – can be surmounted with efforts from various stakeholders. IHL should organise regular communications to maintain interactions with business undergraduates during crisis. Under the new normal of learning, the Teaching and Learning Unit should have a new mission to assist business undergraduates to overcome technophobia of e-learning, quickly adapt to e-learning and achieve maximum effectiveness from e-learning. The e-learning specialists should issue general guidelines or best practices on effective e-learning (Reimers & Schleicher, 2020), operate a dedicated e-learning website, provide training to business undergraduates and lecturers on learning management systems and technical consultation. At the beginning of each semester, lecturers should teach business undergraduates how to overcome disadvantages associated with e-learning during the present crisis. In addition, lecturers can set specific time each week for social interactions and conduct synchronous consultation to understand business undergraduates' problems and stress, clarify their confusion and motivate them to persevere. Stated differently, lecturers employing a high tech and high touch approach (Looi, 2021). Student counsellors can adopt a human-centred approach (UNESCO, 2020d) to contact all business undergraduates on a regular basis for social interaction, to understand their problems and stress, to provide advice on how to cope with their academic workload and how to manage their physical and emotional well-being during this crisis. If the actual or perceived disadvantages of e-learning can be successfully surmounted, business undergraduates who preferred conventional classroom learning will have a more favourable attitude in adopting e-learning.

SRL can be trained or nurtured (Mou, 2021). E-learning specialists from the Teaching and Learning Unit can organise compulsory training on SRL for e-learning prior to e-learning classes. Moreover, if e-learning is practise in the future, whether under normal or crisis circumstance, SRL must be maintained throughout the semester, for example, via scheduled synchronous meetings or tutorial classes with attendance closely

monitored. Throughout the whole semester, lecturers should (re)emphasise the importance of SRL for e-learning so that business undergraduates are mentally and physically prepared. Lastly, the development of business undergraduates' SRL will develop their non-academic abilities as well, such as life-skills (PROJECT ID, 2022) and prepare them for life-long learning (Looi, 2022).

The hastily implemented e-learning is likely to be less effective than conventional classroom learning (Hodges et al., 2020). However, after SRL training discussed in the preceding paragraph, business undergraduates should be more active metacognitively, motivationally and behaviorally in their learning processes. As a result, business undergraduates improve their learning outcomes and subsequently metamorphose from being overwhelmed or surrenderers to adapters of e-learning (Looi et al., 2022). In sum, understanding why business undergraduates preferred conventional classroom learning enables various stakeholders to help business undergraduates to overcome these three adversities arising from the sudden shift to e-learning.

The third research question was how can IHL prepare for future crises and simultaneously craft education experiences that match how undergraduates want to learn in the future? The unprecedented disruptions brought about by the COVID-19 pandemic represent an opportunity for IHL to strengthen their resilience and design better learning experiences for their undergraduates in the face of ongoing and future adversities. E-learning was initially adopted as a temporary stop-gap measure before IHL are ready to reopen. However, after experiencing the benefits of e-learning, the business undergraduates are asking for blended learning. Blended learning offsets limitations inherent in conventional classroom learning and e-learning, improves learners' learning experiences and develops the digital skills essential for 21st century (Looi et al., 2022). Moreover, integration of e-learning is an inevitable trend for the digital generation. IHL who failed to respond accordingly is unlikely to attract these digital generation customers. Therefore, considering the need for future crisis preparedness, leveraging on digital tools adopted during the sudden closure of IHL and meeting future preferred mode of learning of business undergraduates, this paper calls for policy makers and management of IHL to seriously and quickly embrace digital education transformation and formulate a far-sighted e-learning policy, rather than treating e-learning as a one-off crisis response plan (Zhou et al., 2020). E-learning should be a feature of educational strategies at the institutional level (Huang et al., 2020), with flexible delivery of education (Huang et al., 2020) to bring learning contents from institutional settings into learners' homes (UNESCO, 2020d). The paradigm shift from e-learning as a temporary solution to e-learning as a crucial element of higher education experience – whether fully e-learning or blended learning – is in line with UNESCO's (2020c) advocacy of comprehensive e-learning strategies which progresses from short-term goal of provision of rapid responses for continuation of education, to a transitional period, to a long-term goal of building flexible, effective and equitable education provision systems.

6. Conclusion

This study adds to the extant body of knowledge by investigating how business undergraduates want to learn in the future and developed a characteristics profile of the three groups of business undergraduates (i.e., those who preferred fully conventional classroom learning, blended learning and fully e-learning) in terms of the predictors that seem to be the most important. The findings provide valuable insights to inform design of specific interventions to help business undergraduates categorised as overwhelmed and surrenderers. This study also recommended digital education transformation and

formulation of a far-sighted e-learning policy for a better learning experience of digital generation. Nevertheless, there are several limitations inherent in this study which pave the way for future research. First, this survey was carried out when all courses were conducted using fully e-learning for the first time. Thus, this study is exploratory in nature. With the passage of time, future replication studies may produce different results given that business undergraduates become accustomed with e-learning or lecturers improved their teaching pedagogy. Second, as literature on e-learning during the COVID-19 pandemic is evolving, some salient predictors may not be captured in this study. Third, the insignificance of household income, location of residence and gender to discriminate future preferred mode of learning may be attributed to the participants surveyed and does not imply that these variables are not important in other contexts. Fourth, findings from this study are not generalisable to other contexts or countries as responses were obtained from Malaysian undergraduates. Notwithstanding, the findings from this study provided contextual insights from the perspective of a developing country, which may be useful for other countries in a similar stage of development and future meta-analysis purposes.

A lot of research is still needed in the immediate future to better comprehend salient antecedents and consequences of e-learning during the sudden closure of IHL and inform various stakeholders to prepare future undergraduates for effective e-learning. For example, have there been unexpected positive educational results from fully e-learning during the sudden closure of IHL? How can educators achieve better learning outcomes using e-learning in the future, especially during a crisis? What are the cross-country similarities and differences in terms of the predictors of future preferred mode of learning during the sudden closure of IHL?

This study concludes with some reflective thoughts about important lessons learned from this unprecedented pandemic pertaining to e-learning readiness to deal with future unexpected crises. The WHO has warned that systems in place for the COVID-19 pandemic will be needed again in the future and IHL need to be better prepared in terms of their educational responses for something that may be even more severe in the future (Parkhill, 2020). In other words, the recurring of sudden closure of IHL. The COVID-19 pandemic serves as a “wake-up call” for all education stakeholders to start preparing a future crisis response plan right now by reflecting, researching and iteratively overcoming associated challenges, such as systematically evaluate workable interventions and understand why these interventions work, identify gaps and find solutions, support more inclusive and equitable education systems responsive to future challenges and provide quality education during crises (UNESCO, 2020c, 2020d). To mitigate future crises, a proactive crisis plan should be devised to rapidly and effectively embrace digital education (Crawford et al., 2020). Lessons learned from fully e-learning to date should serve as inputs to formulate adaptive, coherent, effective and equitable national e-learning policy as a future digital strategy for education (Crawford et al., 2020) and educational response plan to deal with future crises (Reimers & Schleicher, 2020).

Author Statement

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