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Assessing Cyberloafing Behaviour among University Students: A Validation of the Cyberloafing Scale

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ABSTRACT

With greater prevalence of Internet access, there is an alarming trend in the number of students using the Internet in the classroom for non-class-related purposes. Cyberloafing (defined as personal Internet use at work or during class) has been extensively studied by researchers in workplace settings but not in education settings. Particularly, there is lack of research on developing a valid and reliable scale to measure cyberloafing behaviour among students. Hence, this study aims to examine the prevalence of cyberloafing activities among university students and to validate the cyberloafing scale of Akbulut et al. (2016) in the Malaysian context. A total of 238 usable data was collected from the 30-item cyberloafing scale that assessed five dimensions of cyberloafing behaviour namely sharing, shopping, real-time updating, access to online content and gambling / gaming. Descriptive analysis shows that students spend more time on sharing- related activities and least time on gambling / gaming-related activities in the classroom. Based on exploratory factor analysis, five factors are retained with most of the items loaded on its intended dimension factors, suggesting evidence of construct validity. The analysis also indicates that convergent validity is achieved as the factor loadings of each set of items measuring its intended dimension factors are above 0.5. Given that the correlations between extracted factors are not highly correlated, discriminant validity is warranted. These results support the investigated cyberloafing scale as reliable and valid.

Keywords: Cyberloafing, university students, Malaysia

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INTRODUCTION

Over the past 15 years, the Internet has caused significant changes in the way we live. In particular, the widespread use of technology and Internet connections has revolutionised the landscape of education in the sense that more emphasis has been placed on the use of information and communication technologies by educators to facilitate effective pedagogy. Given that the current generation of students are highly tech-savvy, effective utilisation of instructional technologies in the classroom has the ability to entice students to pay more attention and be more actively involved in class (Lam & Tong, 2012). In recent years, blended learning, a mode of learning that incorporates face-to-face learning processes with online instruction and communication, has been widely adopted by educators due to its positive ramification on the academic performance of students (Rovai & Jordan, 2004).

Nevertheless, recently, the use of digital devices in the classroom has become a debatable topic among researchers due to potential positive and negative outcomes (Lam & Tong, 2012). For example, Mackinnon and Vibert (2002) discovered that the use of computers in classroom instruction could potentially have a positive impact on student motivation to study and increase academic achievement when appropriately utilised. Another study by Apperson, Laws and Scepansky (2006) found that students learn better and are more receptive to their instructors when classes are conducted with the visual aids of PowerPoint compared to conventional 'chalk-and-talk' methods. Furthermore, in a two-year research project conducted by Project Tomorrow (2015), 127 students and their four assigned teachers were given Android tablets with Internet access for use at both home and school. Interestingly, the results of the study showed notable improvements in the students' reading, writing fluency and participation in the classroom.

Today, students carrying digital devices such as tablets, smart phones and laptops in the classroom is a common occurrence for either class-related or non-class related purposes (Ragan, Jennings, Massey, & Doolittle, 2014). Ideally, educators expect students to use digital devices in an appropriate manner, primarily for class-related purposes such as to look for information related to their lessons or answering online pop quizes, with the aim of facilitating the learning. However, despite the benefits, the use of digital devices has led to some issues. Previous studies have reported that multitasking while attending lectures can lead to impaired learning performance (Fried, 2008; Ravizza, Hambrick, & Fenn, 2013). Moreover, Sana, Weston, & Cepeda (2013) noted that multitasking poses a serious threat to student comprehension of class material. In addition to that, Hembrooke and Gay (2003) also determined that students who are not permitted to use their laptops during class are able to recollect class content significantly better than those who are permitted to use them.

At the same time, it would not be realistic to expect students to use digital devices solely for class-related purposes. Cyberloafing, which refers to student Internet use for non-class-related purposes in the classroom, is a growing concern among educators with researchers viewing it as roadblock to effectively imparting knowledge to students (Taneja, Fiore, & Fischer, 2015). Examples of cyberloafing activities include browsing social networking sites, watching videos online, playing online games, posting tweets and listening to online music and sending emails (Akbulut, Dursun, Donmez, & Sahin, 2016; McCoy, 2016; Taneja et al., 2015). Based on these prior findings, it appears that it is not unreasonable for some instructors to disallow students to use digital devices in the classroom. For example, some professors have explicitly prohibited students from using digital devices during their classes in the hope that students shall pay more attention and take important notes (Guessoum, 2016; Heyboer, 2016).

As the situation of university students' cyberloafing in the classroom becomes increasingly severe, several studies have attempted to examine factors that influence such behaviour (McCoy, 2016; Ragan et al., 2014; Sana et al., 2013). However, a review of existing literature on the subject reveals that empirical studies on cyberloafing in educational environments are mainly exploratory in nature, using demographic characteristics as predictors of cyberloafing. For example, by conceptualising cyberloafing as a three-dimensional construct namely personal business, news follow-up and socialisation, Baturay and Toker (2015) found that gender, grade and Internet experience are significant predictors of three dimensions of cyberloafing. Additionally, Internet skills are reported to be only significantly related to socialisation while Internet usage is significantly associated with personal business and socialisation but not news follow-up. Meanwhile, another study by Karaoglan-Yılmaz, Yılmaz, Oztürk, Sezer and Karademir (2015) observed that the frequency of cyberloafing is significantly different in terms of gender, departments of study and Internet use frequency.

However, the results of these studies (see Baturay & Toker, 2015; Karaoglan-Yılmaz et al. 2014) might be flawed, or highly questionable, as the adaptation of the cyberloafing scale from Kalaycı (2010) has been criticised for its content validity (Akbulut et al., 2016). Firstly, the cyberloafing scale of Kalaycı (2010) was modified from the scale proposed by Blanchard and Henle (2008) that was developed for use in work-based settings rather than education settings. It is important to recognise that the types of cyberloafing activities in which students engage can be completely different from employees (Koay, Saw, & Chew, 2017). Secondly, Kalaycı (2010) removed too many items in adapting the scale to measure cyberloafing among students, resulting in a loss of excessive information from the original scale which

could potentially lead to inadequacies in measuring the concept of cyberloafing comprehensively.

Given these weaknesses, Akbulut et al. (2016) empirically tested the scale of Kalaycı (2010) on four different samples and concluded that the scale was indeed problematic and incomplete based on expert validations and confirmatory factor analysis. Therefore, Akbulut et al. (2016) proposed a new cyberloafing scale specifically for use in education settings through a series of rigorous scale development procedures. The final scale consists of 30 items ranging across five different dimensions - sharing, shopping, real-time updating, accessing online content and gaming or gambling.

To date, the cyberloafing scale of Akbulut et al. (2016) has not been empirically validated or adapted in any study. In the work by Cowles and Crosby (1986), it is stated that validating a measure through a single investigation may not be sufficient. The construct validity of a scale should be validated through different contexts with different population groups in order to determine the psychometric merit of the instrument (Cowles & Crosby, 1986). This study aims to make contribution of validating the cyberloafing scale in the Malaysian context. According to a survey report published by Malaysian Communications and Multimedia Commission (MCMC, 2016), it is estimated that about 77.6% of the entire Malaysian population are Internet users. The report also indicated that school-goers are those who spend most of their time on the Internet on an average of three hours in a day. Similarly, some studies also found that Malaysian college students are excessive Internet users, spending about three hours every day for various purposes including entertainment, social networking, education and others (Haque, et al., 2016; Sian, Yamin, & Ishak, 2013; Teong & Ang 2016). Yet, not many studies have explored the types of cyber activities in which students engage in the classroom, particular in the Malaysian context.

This paper has the following objectives: (a) to investigate the prevalence of cyberloafing behaviour among university students; (b) to examine the factor structure of the cyberloafing scale of Akbulut et al. (2016) in a sample of Malaysian university students by means of exploratory factor analysis; and (c) to evaluate scale reliability. The implementation of the proposed scale and its improvement are in the following section.

METHOD

Research Design

The implementation approach in this study is empirical, which is quantitative in nature, aimed to validate the survey instrument. The sampling population in this study are university students. Such sampling is selected since the main focus of this study is to examine cyberloafing behaviour among university students in the classroom. Prior to distributing the final questionnaire to the target respondents, it was pre-tested on six undergraduated and two academic experts with a good track record of international

publications on Internet-related research. This was also done in part because pre-testing was deemed an imperative step for this research for two major reasons. Firstly, it was to assess the need to translate the English version of the questionnaire into Malay, since some students might not be well-versed in English due to lack of English knowledge. Based on the feedback from pre-test samples, it was concluded that it was translation was not necessary, since all the questions were in simple, easy to understand English. Secondly, it was to ensure the face validity and psychometric properties of the instrument.

Sample

It is vital that the university from which student data is collected, provides wireless access which allows students to connect to the Internet throughout the campus. To achieve this, three lecturers working in a large private university, a high-tech campus, in Malaysia were requested for their assistance to collect data from their classes over two semesters. Students were given the choice to not participate in the questionnaire. Participants were ensured that their answers would have no subsequent impact on their coursework or final marks. Out of the 300 distributed questionnaires, only 280 completed questionnaires were received.

All analyses performed in this study were conducted using the Statistical Package for the Social Sciences (SPSS) version 22.0 for descriptive analysis and exploratory factor analysis. To ensure the quality of the data, descriptive analysis was performed to detect outliers and identify cases with serious missing values or silver lining pattern (Bryman & Bell, 2015). Unreliable data were deleted leaving a total of 238 usable data for further analysis. The final sample size was deemed to be sufficient for performing exploratory factor analysis based on five cases per measure recommendation (Hair, Black, Babin, & Anderson, 2014).

The sampling population of university students comprised 42.9% males and 57.1% females. In terms of race, they were 45.4% Malays, 26.5% Chinese, 14.3% Indians and 13.9% were of other ethnicities. Furthermore, almost all the respondents (98.7%) reported that they accessed the Internet on a daily basis. Two-third of the respondents (62.9%) perceived themselves as competent Internet users (advance or expert). The general profile of the survey respondents is presented in Table 1.

Table 1
Profile of the survey respondents

Demographic		Percentage	Frequency (%)
Gender	Male	102	42.9
	Female	136	57.1
Race	Malay	108	45.4
	Chinese	63	26.5
	Indian	34	14.3
	Others	33	13.9
Internet Usage	Everyday	235	98.7
	Couple days in a week	3	1.3
	Never	0	0.0
Internet Skills	Novice	6	2.5
	Intermediate	83	34.9
	Advance	104	43.7
	Expert	45	18.9

Measures

The objective of this paper was to examine the prevalence of cyberloafing behaviours among university students and to validate the cyberloafing scale of Akbulut et al. (2016). The scale of Akbulut et al. (2016) consisting of 30 items was used to measure cyber activities commonly performed by students. Responses were rated on a 7-point Likert scale, varying from 1 = never, 2 = rarely, 3 = occasionally, 4 = sometimes, 5= frequently, 6 = usually and 7 = every time. The Likert scale is defined according to the extent students engage in each cyber activity in the classroom.

RESULTS

The research objective of examining the prevalence of university student cyberloafing behaviour was tested via the frequency of each cyberloafing activity. This is reported and shown in Table 2. According to the mean values, the top three cyberloafing activities in the classroom among students are chatting with friends", giving a like to posts that are interesting and checking friends' posts. Meanwhile, the three least performed cyberloafing activities are betting or gambling online, visiting betting or gambling sites, and shopping online. However, downloading related activities are found to be less prevalent in the classroom among students as downloading music, videos or mobile applications consumes large amount of mobile data, which is expensive and inconvenient for students.

Moreover, students seem to be more active in social networking sites compared to other types of cyber activities in the classroom, consistent with Akbulut et al. (2016). In addition, the results of this study are similar to the study of Yusop and Sumari (2013) reporting that Malaysian young adults use social networking sites

mainly for socialisation (88%) followed by information searching (65%), reading (28%), sharing (23%) and online shopping (12%). Furthermore, almost half of the respondents stated that they never use *Twitter* in the classroom while another half admitted that they use *Twitter* in the classroom, in varying frequency, from rarely to every time.

Also, not surprisingly gambling-related online activities are the least performed cyberloafing activities for a few reasons. Firstly, the Muslim population comprising 60% of the Malaysian population are not permitted to gamble by Islamic legalities. Secondly, gambling requires concentration which may be difficult for students especially during class.

Table 2
Prevalence of cyberloafing behaviour

Items	Cyberloafing activities	1	2	3	4	5	6	7	Mean	Std Dev
Sa1	*I check my friends' posts*	25	50	48	82	20	12	1	3.261	1.331
Sa2	*I check my friends' social networking profiles*	43	71	42	53	23	5	1	2.836	1.367
Sa3	*I share content on social networks*	56	67	35	55	15	6	4	2.748	1.465
Sa4	*I like posts that are interesting*	31	44	46	60	28	22	7	3.437	1.597
Sa5	*I comment on shared photos*	50	74	44	48	11	8	1	2.678	1.352
Sa6	*I post status updates on social networks*	80	86	30	30	9	2	1	2.210	1.228
Sa7	*I tag friends on photos*	95	74	36	20	8	4	0	2.089	1.209
Sa8	*I chat with friends*	24	37	51	64	34	15	11	3.576	1.551
Sa9	*I watch shared videos*	73	60	34	52	11	6	2	2.555	1.433
So1	*I shop online*	158	47	15	11	4	1	0	1.555	0.973
So2	*I visit deal-of-the-day websites*	131	57	21	17	9	2	1	1.849	1.220
So3	*I visit online shopping sites*	116	58	24	24	11	4	1	2.042	1.337
So4	*I visit auction sites (e.g. e-bay)*	153	56	10	11	6	1	1	1.605	1.057
So5	*I use online banking services*	110	64	21	31	7	4	1	2.063	1.309
So6	*I visit online shops for used products*	144	44	20	15	11	3	0	1.793	1.237
So7	*I check job advertisements*	155	44	11	19	6	2	0	1.662	1.127
Aoc1	*I download music during class*	74	80	39	31	8	2	2	2.292	1.256
Aoc2	*I watch videos online*	88	62	37	36	6	7	2	2.324	1.393
Aoc3	*I listen to music online*	125	52	23	19	10	5	3	2.004	1.407
Aoc4	*I download videos*	144	51	16	20	4	2	0	1.713	1.106
Aoc5	*I download applications I need*	57	64	38	42	22	10	4	2.806	1.550
Gg1	*I visit betting/gambling sites*	214	14	5	2	1	0	2	1.193	0.744
Gg2	*I bet/gamble online*	216	13	4	2	1	0	2	1.181	0.733
Gg3	*I check online sport sites*	134	29	17	31	10	8	9	2.218	1.727
Gg4	*I play online games*	158	31	16	18	7	6	2	1.786	1.369

Table 2 *(continue)*

Items	Cyberloafing activities	1	2	3	4	5	6	7	Mean	Std Dev
Rtu1	*I comment on trending topics*	162	33	17	15	9	2	0	1.664	1.171
Rtu2	*I post tweets*	110	54	24	31	14	4	0	2.144	1.370
Rtu3	*I read tweets*	124	34	34	26	10	6	3	2.131	1.483
Rtu4	*I favourite a tweet I like*	105	33	31	32	22	12	3	2.500	1.681
Rtu5	*I retweet a tweet I like*	114	32	32	28	15	14	3	2.378	1.666

Exploratory Factor Analysis

The main purpose of performing exploratory factor analysis (EFA) is to identify the underlying structure among the variables. In this present study, Bartlett's test of sphericity is significant ($p<0.01$), and the Kaiser-Meyer-Olkin measure of sampling adequacy is 0.860, which is far higher than 0.6 as the cut-point (Tabachnick & Fidell, 2007), suggesting the data is suitable and appropriate for factor analysis. Next, principle component analysis was chosen as the method of factor extraction using an orthogonal rotation of varimax on the data to determine the underlying factor structure and to evaluate the construct validity of Akbulut et al.'s (2016) cyberloafing scale.

The criteria used to extract the factors were according to:

1) Keiser's criterion (eigenvalue must be greater than 1) (Kaiser, 1958)
2) Scree Plot (Cattell, 1966)
2) The loading score for each item >0.50 (Pallant, 2007)
3) Factors must have more than 3 items loaded (Pallant, 2007)

By evaluating the eigenvalues and by observing the scree plot, five factors were retained, which accounted for 61.07% of the total variance of the scale, reaching a satisfactory level (Hair et al. 2014). This is shown in Table 3 and Figure 1. The factor structure is similar to Akbulut et al.'s (2016) consisting of five sub-dimensions of cyberloafing. The majority of the items are loaded in accordance to their intended factors; no major cross-loadings were observed, showing evidence of uni-dimensionality for all the five factors. As a result, it can be concluded that convergent validity is achieved. Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct. Furthermore, with the correlation values between constructs lower than 0.9, no sign of collinearity is shown, thus suggesting evidence of discriminant validity. Constructs are distinct and unrelated to each other. Discriminant validity refers to the extent to which the constructs are theoretically distinct from each other (Bryman & Bell, 2015).

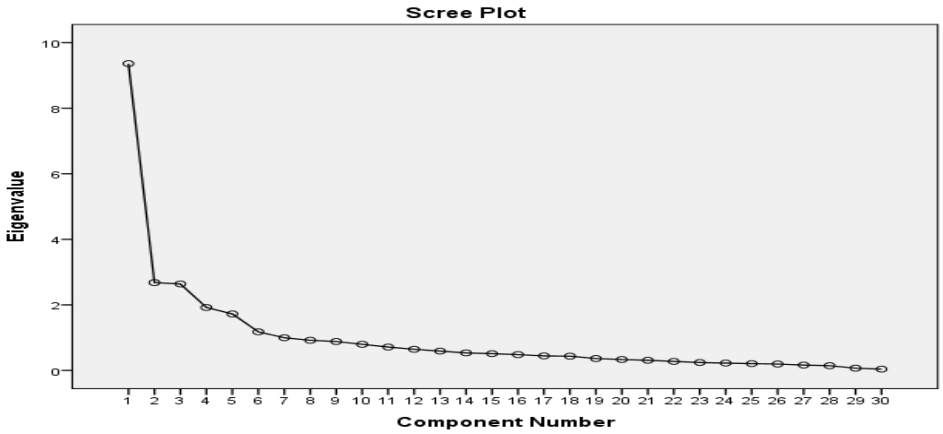

Figure 1. Scree Plot

Table 3
Rotated component matrix

	Component				
	1	2	3	4	5
Sa5	.765				
Sa2	.721				
Sa1	.710				
Sa7	.708				
Sa4	.693				
Sa6	.681				
Sa3	.670				
Sa8	.609				
Sa9	.596				
So3		.810			
So2		.809			
So4		.794			
So5		.713			
So6		.699			
So1		.647			
Rtu5			.939		
Rtu4			.934		
Rtu3			.898		
Aoc2				.681	
Aoc5				.658	

Table 3 *(continue)*

	Component				
	1	2	3	4	5
Gg3				.591	
Aoc1				.537	
Gg2					.928
Gg1					.908
Gg4					.547
Eigenvalue	9.360	2.680	2.638	1.920	1.723
% Variance	31.199	8.934	8.794	6.400	5.744
Cronbach's alpha	0.890	0.886	0.958	0.682	0.696

*factor loadings <0.5 are compressed

Table 4
Means, Standard Deviation and Intercorrelations

	M	Sd	Sa	So	Rtu	Aoc	Gg
Sa	2.524	0.895	1				
So	1.818	0.954	.469**	1			
Rtu	2.336	1.548	.321**	.252**	1		
Aoc	2.410	1.066	.441**	.496**	.262**	1	
Gg	1.387	0.784	.135*	.272**	.210**	.335**	1

M = Mean, Sd = Standard Deviation, Sa= Sharing, So = Shopping, Rtu = Real-time updating, Aco = Accessing online content, Gg = Gambling/ Gaming
** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

DISCUSSION

Among the 30 existing items, five items (Aoc3, Aoc4, So7, Rtu2, Rtu1) were deleted from the scale. The basis for the removal of these items is their low factor loading (lower than 0.5) or factors with less than three items, thus excluding the factors. The internal consistency of each factor is assessed through Cronbach's alpha (α) method. The Cronbach's alpha (α) values of all the factors range from 0.682 to 0.958, which is acceptable for establishing internal consistency of factors (George & Mallery, 2003; Kline, 2000;).

There were eight items (Sa1, Sa2, Sa3, Sa4, Sa5, Sa6, Sa7, Sa8) which loaded under Factor 1, with an eigenvalue of 9.360, explaining 31.199% of the total variance. Sample items: "I share content on social networks" and "I chat with friends". All items were loaded on its intended factor, consistent with Akbulut et al.'s (2016). This

suggests that the majority of students use the Internet mainly for socialisation and sharing information during class. Therefore, this factor is labelled as sharing.

Factor 2 consisted of six items (So1, So2, So3, So4, So5, So6), with an eigenvalue of 2.680, explaining the 8.934% variance. This factor is mainly related to online shopping activities and therefore labelled as shopping. Sample items: "I visit online shopping sites and I visit deal-of-the-day websites". The results indicate that some students may lose focus in class by diverting their attention to online shopping. Research has reported that educated youngsters are the most loyal clients of e-shops, especially on clothing and shoes (PMR Research, 2012). Possible reasons why young people prefer to shop online includes convenience, availability of information, product variety, and cost and time efficiency (Monsuwe, Dallaert, & Ruyter, 2004; Prasad & Aryasri, 2009).

Factor 3 was labelled as real-time updating, consisting of three items (Rtu3, Rtu4 and Rtu5), with an eigenvalue of 2.638, explaining 8.794% of the variance. This factor focuses on reading, re-tweeting and marking content updated by those whom they follow as favourites on *Twitter*, which is a popular micro-blogging tool in which people share small pieces of digital content with their followers. These contents can be in any form such as texts, pictures, videos, or other forms of media. It can be noted that the number of active *Twitter* users in Malaysia has been growing steadily and is expected to increase up to 2.4 million in 2019 (Statista, 2016).

There were four items (Aoc1, Aoc2, Aoc5, Gg3) in loaded Factor 4, with an eigenvalue of 1.92, explaining 6.4% of the total variance. This factor includes cyber activities such as watching videos online, downloading music online, using applications and checking online sport sites. Hence, it was labelled as accessing online content. In item Gg3, "I check online sport sites) is originally categorised under the factor of gaming/ gambling in Akbulut et al. (2015). However, checking online sport sites is more related to the factor of accessing online content rather than gaming. For example, students often spend time checking real-time scores for live sports events during classes.

There were three items loaded in Factor 5 (Gg1, Gg2 and Gg3), with an eigenvalue of 1.723, explaining 5.74% of the total variance. Sample items included "I play online games" and "I visit betting/gambling sites". Due to the nature of these activities requiring a large amount of attention and concentration, students can easily get distracted with short attention spans in the classroom, subsequently affecting their ability to comprehend class material. It is expected that cyber activities categorised under this factor will not be widely indulged by students as gambling is prohibited for Muslims by Sharia law in Malaysia, and playing online games in the classroom is seen as a form of disrespectful behaviour towards instructors.

Despite elimination of several items, the results of this study confirmed the original five-factor cyberloafing scale of

Akbulut et al. (2015), showing evidence of reliability and stability of the scale in a different context. It is highly recommended that future studies on cyberloafing in educational settings adapt the cyberloafing scale developed by Akbulut et al. (2015) instead of the previous cyberloafing scales (e.g., Baturay & Toker, 2015; Kalaycı, 2010; Karaoglan-Yılmaz et al., 2015) which are obsolete, and inadequate in capturing the conceptual domain of cyberloafing comprehensively without considering contemporary cyber activities. It is important to acknowledge that the rapid pace of technological advancement has been a critical factor in the emergence of new types of cyber activities. For example, when first launched, *Facebook* was mainly for posting status and pictures. Subsequently, *Facebook* added many new features such as "like" button, live streaming, photo tagging and others. These are important elements which need to be taken into consideration in the cyberloafing scale.

CONCLUSION

Extant studies on cyberloafing in educational contexts have mainly utilised outdated cyberloafing scales to measure the construct of cyberloafing. Failing to incorporate new types of cyberloafing activities to measure cyberloafing behaviour can lead to biasness in results. Previous studies have conceptualised cyberloafing as a single general construct (Gerow, Galluch, & Thatcher, 2010; Taneja et al., 2015) or 3-dimensional construct (Baturay & Toker, 2015; Karaoglan-Yılmaz et al., 2015), all of which have been proven to be incomplete and problematic (Akbulut et al., 2016). This is because different dimensions of cyberloafing have their own set of antecedents (Blau, Yang, & Ward-Cook, 2006). For instance, boredom may be a strong predictor of the use of social media but a weak predictor of online gambling behaviour in the classroom. Therefore, a complete understanding of students' cyberloafing during class can only be acquired if researchers take various dimensions of cyberloafing into consideration. This work makes contribution in adapting and validating the cyberloafing scale in the Malaysian context. Further studies are urged to follow Akbulut et al.'s (2016) conceptualisation of cyberloafing as a five-dimensional construct.

LIMITATIONS AND FUTURE RECOMMENDATIONS

The present research has several limitations which should be taken into consideration. Firstly, the data was collected from a private university and therefore the findings may not apply to the entire Malaysian student population. Secondly, the cyberloafing scale of Akbulut et al. (2016) validated in this study does not include latest cyberloafing activities such as live streaming, photo editing, taking selfie and others. Future research should incorporate all these elements into the scale so as to measure cyberloafing more comprehensively.

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