

Using Facebook as an Alternative Learning Tool in Malaysian Higher Learning Institutions: A Structural Equation Modeling Approach

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Abstract—Networking is important among students to achieve better understanding. Social networking plays an important role in the education. Realizing its huge potential, various organizations, including institutions of higher learning have moved to the area of social networks to interact with their students especially through Facebook. Therefore, measuring the effectiveness of Facebook as a learning tool has become an area of interest to academicians and researchers. Therefore, this study tried to integrate and propose new theoretical and empirical evidences by linking the western idea of adopting Facebook as an alternative learning platform from a Malaysian perspective. This study, thus, aimed to fill a gap by being among the pioneering research that tries to study the effectiveness of adopting Facebook as a learning platform across other cultural settings, namely Malaysia. Structural equation modeling was employed for data analysis and hypothesis testing. This study finding has provided some insights that would likely affect students' awareness towards using Facebook as an alternative learning platform in the Malaysian higher learning institutions. At the end, future direction is proposed.

Keywords—Learning Management Tool, Social Networking, Education, Malaysia.

I. INTRODUCTION

RECENTLY, the widespread nature of Facebook has drawn the attention of educators. Networking is crucial for the students to better understandings; therefore, social networking plays an important role in the education. Another study found that educational discussions through Facebook improve students' learning performance [1]. They further noted that Facebook may serve as a promising teaching tool for the educators [1]. Coleman has studied the importance of networking in education and found that networking brings academic success [2]. "Any technology that is able to captivate so many students from so much time not only carries implications for how those students view the world, but also offers an opportunity for educators to understand the elements of social networking that students find so compelling and to incorporate those elements into teaching and learning" [3]. Semo and Karmel further stated that social networking

increases the students' educational engagement [4]. Another study found that a student's academic performance is positively related to his/her engagement in online learning [5]. Besides, incorporating Facebook into education and teaching as this will improve the overall education quality through interactive learning [6].

The education industry in Malaysia continued to be one of the most important foreign revenue earners, contributing to the expansion of the country's assets and reinforcing to improve economic reform. Unlike its ASEAN neighbors, Malaysian education industry is considered as one of the most important industries for the country's economy. Therefore, the Malaysian government has placed internationalization of higher education in their national economic agenda [7] which aimed to have 150,000 international students by 2015 [8]. To achieve the objectives outlined in the government's economic agenda, Malaysian education industry has to be a pioneer in the modern technology adaptation. Thus, the use of Facebook for teaching and learning needs to be incorporated as a learning management system to attract more potential local as well as foreign students. However, in Malaysia, incorporating Facebook in the higher learning is still in the beginning stage [9]. Students do prefer Facebook as a new form of LMS [10].

Realizing the huge potential, various higher learning institutions in Malaysia have moved to the area of social networks to interact with their students especially through Facebook. Thus, measuring the effectiveness of Facebook as a learning tool has become an area of interest for academicians and researchers to develop effective and efficient strategies to incorporate Facebook as an alternative learning management system (LMS) in the educational institutions. Besides, as university education is student focused, it is therefore important to consider students' perceptions of technology that is integrated into their learning environment [11]. Adding to this, there are a lot of ways Facebook can be incorporated into the education system. Thus, this study is undertaken realizing the need to examine closely the effectiveness of adopting Facebook as an alternative learning management system with a particular focus on the users from Malaysia.

II. LITERATURE REVIEW

A. Theoretical Background

The theoretical base of this study relies on Davis's Technology Acceptance Model (TAM)., TAM was proposed by Davis which could able to describe the technology

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adaptation with the numbers of factors and that is why this theory is said one of the most extensive and popular frameworks [12]. This model mainly focuses on the attitudes towards it and then determined by his/her intention to use, which then generate behaviors. Besides, Davis asserts that "the belief-attitude-intention-behavior connection envisages and elucidates user the technology acceptance"[12], [13]. However, the model is recognized for technology acceptance has confirmed to be a considerable academic model in serving and illumination the user behavior of information technology [14]. This model provides a foundation with the explanation how external variables influence belief, position and intend to use. At the same time, TAM model finds wide range of applications in learning and acceptance of internet technology, such as web page browsing and building a social networking [15].

Facebook is a part of the internet learning tool and an effective technology where users use its various dimensions by adopting of accepting the technology. In fact, technology taking tendency and ability may refer as a user's willingness and acceptability as well as the agreement and unremitting using of technological expertise. Concerning this, the technology acceptance and use of technology acceptance model (TAM) is the basis of an acceptance, learning the theory of rational action and this theory can help in building up a model for illumination and to explain the consequences for predicting the users' tendency of acceptance and recognition of an information system [16], [17].

B. Adoption of Facebook as an Alternative Learning Tool (AFB)

From the learning perspective, there are many ways of learning whereby technology and many social media with proper networking can be used for learning purposes [18]. In fact, to achieve this learning, the adoption with the technology is the main focus for technology is totally based on adoption. When it is said that the measuring the effectiveness of adapting Facebook can be considered as an alternative learning tool, then there are a lot of issues raises. Karpinski and Duberstein mentioned that many individuals and even organizations are already getting advantages from using forums, blogs, journals and even sharing things by using Facebook. The Facebook is considered user-friendly and that is how people are sharing their ideas and even videos by using it [19].

Similarly, learning through Facebook or any other online social media ultimately manages content relating to the directive, standard operating procedures and observance; at the same time the personal information and other sensitive elements which should be rationally and logically safeguarded [19]. Facebook as the social networking in fact is very trustworthy in that sense and it has the power and policy behind it as how this can be observed and controlled [20], [21]. To transmit the learning objectives through Facebook, it is really vital as how learners are taking the ideas and knowledge in academic point of view [22]. However, it is also kind of evaluating matter that moderately the use of Facebook

as an administration tool or classroom instrument in an academic setting is getting popular day by day [23]. Since a successful faculty has a poised and positive verdict on using online social networking like Facebook, it sometime plays a fundamental and crucial role in some certain circumstances in academia. Yet, the technology adoption is the key issue to learn the phenomenon as a whole.

C. Ease of Use (EU)

Ease of Use or EU is the degree to which the prospective user expects the potential system to be free of effort [24]. Basically, the EU is the user-friendly components in the technology. The EU is in general concept is an indication of getting advantage comparatively. It is in fact found to be one of the best predictors and positively related to an innovation's rate of adoption [25]. Therefore, growing awareness and understanding the advantage of e-business among Malaysian organizations can completely influence their aspiration and concentration in adopting e- business technology in their organizations. However, when it comes to an individual, the adoption can be simplified into the learning process. This process can be discussed through the benefits of using social media for students and general learners as well as some of the drawbacks and obstacles [25], [26]. It is somehow clear that digital natives will make over the scenery of higher education in the future, so long as the learners and learnt people of today can begin to hug the appropriate use of social media like Facebook in their courses [27]. Basically, that is how the EU is being transformed in the learning process. However, the insinuations of moving towards social media as like using Facebook learning are vast and rewarding in many ways [28]. Instructors and facilitators, therefore, need to grab the opportunity of this highlight and employ it in the interest of the learners in higher education.

Hence, from the EU perspective, using social media tools like Facebook and some other sources the education representation to suit the learning needs. Besides, people implement learning tools based on the convenience sometime and the extent to which a person a meticulous tool as justifiable to use in the learning journey. Hence, EU in using the internet or technological facilities has a great impact on higher learning. Basing on the above discussion, the following hypothesis is drawn:

H1. There is a significant positive relationship between ease of use and adoption of Facebook as an alternative learning tool in the Malaysian higher learning institutions.

D. Intricacy (INT)

Sometime Intricacy makes lowering the adoption in technological elements or social networking [29]. Despite Facebook's potential benefits of education, such as enhanced communication and learning, many instructors are not Facebook users and have elected not to use it for student-related academic purposes. Facebook also allows users and learners to communicate with others and sharing knowledge [30]. University students have a countless of grounds for visiting Facebook as online social- networking site. Whether it

is connecting with friends and family in spite of places, maintaining the communication for latest events and activities or making new friends with similar interests, Facebook permits and provides for one-stop social networking [19].

For the purpose of learning in terms of Facebook social networking in higher education, in recent years, universities have also become links on Facebook, using correspondence and announcement as well as some learning tools to promote, regulate and develop a kind of entry to their knowledge and awareness. However, using Facebook and the effectiveness is getting higher and higher in educational sectors as well. As it is mentioned earlier, many investigations on Facebook use tend to focus on enlightenment, what the site is and why learners, specifically students' may desire to use it to connect with faculty and their management [31], [32]. However, sometime using Facebook is seen also as a kind of evaluating the substance of an administration tool. Since a successful faculty has a poised and positive verdict on using online social networking like Facebook, it sometime plays a fundamental and crucial role in some certain circumstances in academia. The disagreement most users using Facebook tolerate with using social media is assessing whether or not it is a rightful set of educational tools that will add value to the learning experience [31]. In the context of higher education, it is observed that, the learners as a casual substitute to the more formal experts and this is the way to achieve the maximum effectiveness in Facebook as a learning tool.

Therefore, if the new technology is more complicated than existed technology; organizations will be reluctant to adopt new technology [33], [34]. At the same time, the dispute most users using Facebook countenance with using social media is assessing whether or not it is a legitimate set of educational tools that will add value to the learning experience [32], [34], [35]. When there is any intricacy for users, the adoption toward technology gets lower. These online sources may include social activities and networking using various tools. Basing on the above discussion, the following hypothesis is drawn:

H2. There is a significant positive relationship between intricacy and adoption of Facebook as an alternative learning tool in the Malaysian higher learning institutions.

E. Adaptability (ADP)

Adaptability is the amount of improvement that is processed as steady with the obtainable values and knowledge as well as the requirements of the adopters. Dawson has found that an innovation is more likely to be adopted when it is compatible with current technology. Adaptability of and innovation with a preceding idea can either speed up or retard its rate of adoption in the organization. In fact, if the new technology fits with the current customers' needs, then organizations will feel more comfortable to adopt it. In this background, the learners from many places can be from to measure adaptability [36]. Internet based social integration requires users to create and uphold social relationships through online social networking [37]. From the Facebook point of view, if a user gets benefit

from using this social media or network, it is obvious that he or she will be learning from that.

Higher education researchers and practitioners have investigated and spent significant attempt to conducting research and implementing the strategies to facilitate users' social amalgamation and found that the key factor is the user satisfaction [23]. User satisfaction and loyalty is seen by a large number of authors as one of the key topics in internet that ought to have a great deal of attention from the research community. The reason for loyalty in the technological circumstance is changing role of the content, the context and the infrastructure in the marketplace [18]. Internet based social integration requires users to create and uphold social relationships through online social networking. For example, Facebook users get satisfaction and through changing the environment in the learning process, Facebook refers something beyond traditional tool [38]. Hence, satisfaction is the key thing to get adopted easily and therefore, learning can take place parallel with satisfaction and adoption. Basing on the above discussion, the following hypothesis is drawn:

H3. There is a significant positive relationship between adaptation and adoption of Facebook as an alternative learning tool in the Malaysian higher learning institutions.

F. Observability (OBS)

Observability is the amount of improvement that is perceived and noticeable to others. Most of the innovations studied in the past diffusion research are technological ideas [39]. But in this case of measuring effectiveness is relatively easy for both users and learner adopters. Online learning is a broad issue when e-business increases company visibility as the website can be seen as a place where the homepage is a virtual market. Websites allow business to be more flexible and reach to mass customers [40]. Customers and suppliers can visit the company websites to search for general information with a quick response anytime and anywhere they can access to the internet. This creates convenience and flexibility of the organization to create relationships with both buyers and sellers.

Likewise, observability can be detected in Facebook using as well. As we know, Facebook has enlarged in attractiveness; it is common to find users, learners and students in the same social freedom [22]. Thus, it is significant to scrutinize the propositions for the educational process. Sometime, teacher Facebook profiles rich in self-disclosure increases probable student motivation, affective learning, and teacher credibility. Students are more willing to communicate with their instructors if they already knew them on Facebook [19]. This observability of knowing and gaining knowledge has a great impact. The impact is basically related to adoption. And, truly this adoption will generate the good environment in higher education [39]. As Malaysia has a wide range of multicultural environment, the implication may be easier. However, using social networking will provide the learning consequences as a whole. Basing on the above discussion, the following hypothesis is drawn:

H4. There is a significant positive relationship between observability and adoption of Facebook as an alternative learning tool in the Malaysian higher learning institutions.

III. METHODOLOGY

Research techniques are determined as the guidelines, tools, dependable and methods to study the truths, to make known the inactiveness and to get the reasons [41]. The research approach of this study is deductive as key variables were derived from the existing theory. This research aims to establish and verify the hypothesized relationships between students perception towards using Facebook as an alternative learning tool and its effectiveness of adaptation in the Malaysian higher learning institutions. This study employs a primary data approach by utilizing a set of structured questions formatted in a five point Likert scale. This study was conducted on a disproportionate stratified random sampling of 500 students studying at various private as well as public higher learning institutions in Malaysia. Hence, the unit of analysis is the students. The survey was conducted between January 2014 and May 2014. The population frame was made available by cross-checking the listings of higher learning institutions in Malaysia. In this study, out of the 500 questionnaires distributed, total 419 were returned, out of which 21 comprise of serious missing information (more than 25%) at various parts of the questionnaire. Following the guideline, these questionnaires were excluded. Rest 398 returned questionnaires were perfectly usable for further analysis [42].

The reliability was obtained by computing the Cronbach's Alpha coefficient. All the factors produced good indices of reliability as all the values are above 0.700 (Table I) and thus, considered acceptable for further analysis [43].

TABLE I
RELIABILITY (CRONBACH'S α)

Component	Reliability (Cronbach's α)
Ease Use of Use (EU)	.810
Intricacy (INT)	.769
Adaptability (ADP)	.810
Observability (OBS)	.839
Adoption of Facebook (AFB)	.886

Finally, to estimate the hypothesized model, this study has employed structural equation modeling (SEM). This was used to test the hypothesis advanced in this study [30]. Following the guideline by the researchers [41], [43], [44], [45], this study has employed and reported the χ statistic together with the associated degree of freedom or the Normed χ (absolute fit index), CFI and GFI (incremental fit index).

IV. RESULTS & DISCUSSION

In the first stage, demographic analysis was conducted as presented in Table II. It was noted from the demography results that the gender of respondents drawn from the survey was quite different, with male respondents constituting 61.6% and female respondents 38.4%. The age of respondents also

shows some sharp contrast, whereby the majority of the respondents (49.0%) were aged 26 to 35, which is considered the age for pursuing higher studies. This is followed by respondents between 36 to 45 years (31.2%). Next were the respondents aged between 0 and 25 comprising of 11.3% and respondents with aged 45 and above were only 8.5%. In terms of educational level, the demography results show that the majority of the respondents held Bachelor degrees (57.0%), followed by Master holders comprising of 36.2% and respondents holding a PhD constitute 6.8% of the total respondents.

TABLE II
DEMOGRAPHIC ANALYSIS

Gender	Education		Frequency	Percent	
	Frequency	Percent			
Male	245	61.6	Bachelor	227	57
Female	153	38.4	Masters	144	36.2
Total	398	100	PhD	27	6.8
			Total	398	100
			Nationality		
				Frequency	Percent
			Asian	159	39.9
			African	77	19.3
			European	68	17.1
			Middle Eastern	94	23.6
			Total	398	100
Age	Income		Frequency	Percent	
0-25	45	11.3	1001-2000	42	10.6
26-35	195	49	2001-3000	108	27.1
36-45	124	31.2	3001-4000	171	43
45 and above	34	8.5	4001 and above	77	19.3
Total	398	100	Total	398	100

The results also show that a total number of 159 respondents (39.9%) consist of Asian origin. This is followed by respondents from the Middle East which comprises about 23.6%. There were also as much as 19.3% of respondents from Africa, followed by respondents from Europe (17.1%). This explains that Muslim students from different countries prefer to study in Malaysia. Finally, the demography results also show that a total of 171 respondents (43.0%) earn 3001-4000 a month. This means that most of the respondents of this study were working persons. Next to this is the sharp contrast, comprising about 2001-3000 per month. This is actually applicable to the local students as their salary ranges between 2000-3000 a month. In the third category, we can observe that total 77 respondents earn above 4000 a month (19.3%). This group consists of the students who works at a higher position or the students from the Middle East and Europe as they get better value when they exchange their currencies to Ringgit Malaysia. The last category is 1001-2000 consists of 10.6% of the total respondents. This group of respondents is mainly from the developing countries such as Indonesia, Bangladesh, India, etc.

To achieve construct validity, exploratory factor analysis

(EFA) was carried out on the basis of data collected from 398 respondents. This was to confirm the underlying dimensions of the EU, INT, ADP, OBS and AFB within the Malaysian Higher Learning Institutional context. In addition, the two measures for inter-correlations among variables supported the use of PCA. Bartlett's Test of Sphericity was statistically significant [$1.361E4$, $p = .000$], while the Kaiser-Meyer-Olkin (KMO) measure of the sampling adequacy (MSA) was .798, indicating that the inter-correlations were sufficient for PCA (Table III).

TABLE III
KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		
	Approx. Chi-Square	1.361E4
Bartlett's Test of Sphericity	df	276
	Sig.	.000

Furthermore, Varimax rotation was performed where total five factors were extracted, explaining 64.937% of total variance. Following the guideline provided by the scholars [43], [44], [45], all four factors were named as Ease of Use (EU), Intricacy (INT), Adaptability (ADP), Observability (OBS) and Adoption of Facebook (AFB), respectively (Table IV).

Confirmatory factor analysis (CFA) was carried out to further confirm the validity of the extracted items. The interrelationships among the measures of the EU, INT, ADP and OBS as well as 5 measures of AFB were checked and found statistically significant. Moreover, there was no serious violation of the assumption of normality was observed. Also, there was no outlier in the Mahalanobis distance. This justifies the conduct of SEM. However, Zainudin suggested that before modeling the structural model, the researcher needs to address the issues of unidimensionality, validity and reliability [46]. As per his suggestion, the followings are discussed.

The results from the first model showed that the fitness level for the measurement model was not achieved [Absolute fit (RMSEA) = .113, GFI = .917; Incremental fit (CFI) = .917; and Parsimonious fit (ChiSq/df) = 3.467, $p = 0.000$] indicating that the hypothesized model was rejected. In other words, there were statistical inconsistency between the hypothesized model and the observed data. The Normed chi square (CMIN/DF) which is an attempt to reduce the sensitivity of chi-square to the sample size, was found to be 3.467, thus, beyond the recommended ≤ 3.0 value. The comparative fit index (CFI) was .917, indicating a lack of a satisfactory fit index for the hypothesized model in relation to the uncorrelated model. The root mean square error of approximation (RMSEA) also showed lack of fit (.113) for the hypothesized model. For a good fitting model, RMSEA should be ≤ 0.08 .

TABLE IV
EXTRACTED FACTORS

Code	Items	Component				
		(EU)	(INT)	(ADP)	(OBS)	AFB
EU1	Facebook is easy to use	.869				
EU3	Facebook helps me to get contact information (email, phone number, etc.) of classmates	.864				
EU4	Uploading files are easier on Facebook	.778				
EU7	I obtain class notes from another student through Facebook	.773				
ADP2	I use Facebook chat to discuss something related to the class	.767				
INT1	Using Facebook would enable me to accomplish my tasks more quickly		.883			
INT2	Facebook is a useful tool for learning		.754			
INT4	Using Facebook would make it difficult for me to carry out my tasks		.799			
INT6	Facebook has a user-friendly layout		.802			
EU2	I trust in the ability of Facebook to protect my privacy	.608				
ADP1	Using Facebook as a learning tool is a good idea			.886		
ADP3	It is easy to use Facebook to accomplish my group assignments			.812		
ADP4	I have the resources, knowledge, and ability to use Facebook			.783		
ADP6	I would use Facebook for my group assignments needs			.709		
INT3	I find it easy to do what I want to do in Facebook		.862			
OBS2	Facebook can create a learning community				.892	
OBS3	A suitable tool for students to co-construct group projects online				.875	
OBS6	Facebook is a useful tool for knowledge sharing				.789	
INT5	Using Facebook is to me a student-driven learning		.799			
AFB1	Facebook can be used to post announcements					.817
AFB2	Facebook can be used to post class schedule or events					.796
AFB3	Facebook can be used to post course syllabus					.789
AFB6	Through Facebook I can post items or material to the groups related to our study					.772
AFB7	Facebook can be used to initiate outside class discussion or debates					.708

V. CONCLUSION

Social networking sites are essentially a way to increase interaction among the teachers and students. It has particularly focused on some relevant issues that represent the effectiveness of using Facebook as an alternative learning tool in the Malaysian higher learning institutions from the students' perspectives. This also narrows a gap in existing literature, owing to the fact that not sufficient studies were conducted in Malaysia in this particular field.

This study has answered the research hypotheses by using surveyed data drawn from 398 students pursuing their higher studies in different higher learning institutions in Malaysia. Using Structural Equation Modeling (SEM), the goodness-of-fit indices addressed the four research hypotheses. This study has provided some insights into the factors that would likely affect students' awareness towards using Facebook as an alternative learning tool. The results have confirmed the findings of previous studies that the characteristics of social networking sites such as ease of use, intricacy, adaptability and observability might affect the attitudes towards adoption of Facebook as a learning tool.

This study will provide for other researchers with a theoretical model if there is a similar research topic and will also benefit marketers who would like to extend their reach to social networking users. The findings of this study have also implications for policy makers in the education sector as well as the human development sector of government organizations. Particularly, policy makers in the education sector and professionals may use the findings of this research to justify their efforts in designing, developing and implementing appropriate learning and performance improvement interventions, so that the overall learning environment could be enhanced continuously.

In addition, academicians can also take relevant initiatives in this regard, whereby the research findings will provide new insights to the faculty members in proper understanding students' expectations. The increased understanding of the expectations and requirements of the students will help in developing new ways of teaching and learning.

Finally, this study suggests that future studies need to be conducted on the impact of several contextual variables in this regard. Since, this is considered as one of the pioneering researches on the contemporary issues of using of Facebook as an alternative learning tool, findings from this study may trigger more research interests among the current and future scholars who might be interested in this field.

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