UBIQUITOUS TECHNOLOGY OWNERSHIP AMONG STUDENTS IN INSTITUTIONS OF HIGHER LEARNING IN MALAYSIA

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Abstract
Taylor Nelson Sofres (TNS) reported that in Malaysia, it was estimated that the number of mobile devices owned (30.4 million devices) was higher than the current population, which is 28.2 million people. This showed a huge potential in implementing the use of technology in the educational sector that may benefit students to indulge in learning. However, little was known about the present ownership of ubiquitous technology (u-tech) such as laptops, smartphones and tablets among students in institutions of higher learning in Malaysia. This study was based on a quantitative research and the population comprised undergraduates from Malaysian Technical Universities (MTUN). A total of 400 questionnaires were analyzed. Results revealed that all 400 undergraduates owned at least one u-tech. A total of 111 undergraduates owned all the three u-tech, 241 undergraduates owned at least two u-tech and only 48 undergraduates owned one u-tech. Eventhough u-tech was perceived as being able to assist learning, yet from the result obtained, it was determined that ownership of tablets was low. It can be concluded that tablets were less popular among many undergraduates mainly for financial reasons or perhaps due to restricted functionality.
Keywords : Ubiquitous Technology,

Introdcution

In this 21st century and with the fast-paced development of computer technology, students have thrived more on mobility. They expect to be able to take their technology with them wherever they go. This gives them immediate gratification and to get feedback as well as information straight away (Margaryan, Littlejohn & Vojt, 2011). In learning, students have their ideal vision on how to make learning more engaging and motivating by using the most updated technology (Kilbane & Milman, 2013). They want their learning environment to look more like the 'world' in which they now live to use technology anywhere and anytime (Beetham & Sharpe, 2013). Therefore, the introduction of ubiquitous technology (u-tech) in education is due to these demands and needs.

U-tech is a refined handheld mobile tool with multiple functions including Internet services, the Gobal Positioning System or GPS navigation, digital camera and video recording (Zhou, Zhang, Jiang & Freeh, 2011). These features make the lives of students easier, as there is surerity that they have constant access to the computer and the Internet and get everything they need in one device (Lance, 2012). U-tech also permits students to gain the latest and most accurate information faster and more easily with Internet ability (Hwang, Wu, Tseng & Huang, 2011). Students can also experience learning in a real-world environment outside the physical classroom and remain connected with their family, lecturers, friends and community (Norman, 2012). Due to the advanced technical specification and the vast function of u-tech, students have been attracted to utilise laptops, smartphones and tablets for learning purposes.

Statement of Problem

In the area of technology utilisation a number of studies have concentrated on the ownership of desktop computers (Saud et al., 2010; Ramachandiran, 2012) and mobile phones (Hussin, Manap, Amir & Krish, 2012) among students at higher education in Malaysia. Yet, little attention was given to examine the ownership of u-tech such as laptops, smartphones and tablets. This study focuses to determine the current status of these technologies ownership among engineering students in higher learning, particularly at MTUN.

Objectives of the study

The main purpose of this study is to determine the ownership of u-tech among students in Malaysian Technical Universities (MTUN).

Methodology

The type of research that was carried out in this study was a survey research and the accessible population were the selected third-year undergraduates from four MTUN. To reconfirm the minimum recommended sample for this study, a Raosoft® software was employed. The proportional stratified sampling was used and questionnaires were distributed randomly to the identified sample in each faculty to each university. The questionnaire was divided into four sections. Section A, collected the student's demographic information, Section B was on technology utilisation, Section C was on the technology competency and Section D was on factors that influence the technology utilisation. For the purpose of this paper, the researcher had discussed only on the analysis done on Section A.

The questionnaire was validated by four panels of experts and 420 responses were stored and directly imported to the SPSS Version 20.0. Prior to data analysis, the questionnaires were screened by checking for missing data. 20 responses were found to contain errors and incomplete values. A total of 400 responses were used as the actual data for this study. The obtained quantitative data were analyzed by using the SPSS version 20.0. The reliability test was conducted to find the consistency of scores and from the analysis, the range of the instruments' reliability was between 0.819 and 0.901.

Findings

This section explained findings on the ownership of u-tech and based on:
i) ownership of laptops
ii) ownership of smartphones
iii) ownership of tablets
iv) overall ownership of u-tech

Ownership of laptops

From Table 1, a majority of respondents (n=389, 97%) have laptops while 11 (3%) respondents have not. From 389 respondents who owned laptops, 199 were males and 190 were females. From 11 respondents who have not own laptops, 8 were males and 3 were females.

Table 1: Laptops ownership

Laptop ownership	Frequency/Percentage		
	Male	Female	Total
Yes	199	190	389
	(50%)	(47%)	(97%)
No	8	3	11
	(2%)	(1%)	(3%)

Ownership of smartphones

From Table 2, a majority of respondents (n=329, 82%) owned smartphones while 71 respondents (18%) have not. From 329 respondents who owned smartphones, 175 (44%) were males and 154 (38%) were females. From 71 respondents who have not own smartphones, 33 (8%) were males and 38(10%) were females.

Table.2: Smartphones ownership

Smartphone ownership	Frequency/Percentage		
	Male	Female	Total
Yes	175	154	329
	(44%)	(38%)	(82%)
No	33	38	71
	(8%)	(10%)	(18%)

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Ownership of tablets and durations of ownership

From Table 4.3, a majority of respondents (n=254, 63%) did not own tablets, and only 146 (37%) respondents owned them. From 146 of respondents who owned tablets, 80 were males and 66 were females. From 254 respondents who have not owned tablets, 128 were males and 126 were females.

Table 3: Tablets ownership

Tablet Ownership	Frequency/Percentage		
	Male	Female	Total
Yes	80 (20%)	66 (17%)	146 (37%)
No	128 (32%)	126 (31%)	254 (63%)

Overall of ubiquitous technology ownership

From Table 4, a majority of respondents (n=241, 60%) have owned at least two u-tech, followed by 111 (28%) respondents who have owned all the three u-tech and 48 (12%) respondents have owned only one u-tech.

Table 4: The overall of ubiquitous technology ownership

Ubiquitous technology ownership	Frequency/Percentage		
	Male	Female	Total
One technology	26 (7%)	22 (5%)	48 (12%)
Two technologies	129 (32%)	112 (28%)	241 (60%)
All the three technologies	51 (13%)	60 (15%)	111 (28%)

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Conclusion and Recommendation

A total of 400 undergraduates owned at least one u-tech item. Almost all of them had a higher ownership rate of laptops (n=389, 97%) and followed by that of smartphones (n=329, 82%). However, not even half of them owned a tablet (n=146, 37%). This seems to suggest that even u-tech was perceived as being able to assist learning, yet from the result obtained, it was determined that ownership of tablets was low. It can be safely concluded that tablets were not popular among many undergraduates mainly for financial reasons, because they are not considered cost-effective or perhaps due to other reasons.

One of the possible reasons could be due to the inconsistent paradigms in owning such u-tech. The undergraduates perceived that there was no purpose in having all three at once, as they almost played the same role and had the same functions. This assumption is consistent with a notion by Zain et al. (2013), who found that a majority of students owned only one or at the most two simultaneously. The students perceived that they were still able to complete learning tasks even with the use of one technology, such as the laptops. This fact seems to support the ownership of one or two u-tech among undergraduates in MTUN.

Ownership of Laptops

Results revealed that laptops were the most popular u-tech owned. Many possible reasons could contribute to this phenomenon. Many lecturers, especially in the engineering programmes encourage laptops usage compared to other technological devices during classes, as it grants instructors to teach with new programs and software easily (Kumar, 2013). With laptops, lecturers

can hold tutorials to demonstrate the use of certain programs, as well as implement in-class learning activities using the latest programs on the students' laptops. This opinion corroborates a study conducted by Alvarez, Brown and Nussbaum (2011).

Laptops are perceived as an important tool as it has more editing options for the media and with various program installed than other u-tech such as smartphones and tablets, which are restricted to a very a few options. This was consistent with a finding by Bonk and Graham (2012). Programs such as Microsoft Office and other software related to engineering programmes such as AutoCAD, CATIA, Math LAB and C++ cannot be installed in other technology except for laptops or desktop computers.

Laptops have more space for larger processors, including dual processor setups and multi-core processors that are high-powered. The notion is consistent with a finding by Koshizuka and Sakamura (2010). This means that students are able to run even the newest and most complex software without crashing the system or causing processor delays that might slow down the flow of work.

Ownership of Smartphones

Smartphones were identified as the second most popular u-tech used. Results showed that less than a hundred undergraduates (n=71, 18%) were found not to have smartphones. Although these undergraduates did not own smartphones, they were assumed to own other types of phones, the conventional mobile phone or feature phone, which are meant to be used for communication purposes (Lance, 2012). Although these technologies were not so advanced when compared to smartphones in terms of functionality and features, the students perceived that with the use of mobile phones, they were still able to communicate with their friends, family and others (Yee & Hargis, 2009).

Smartphones were also used in place of computers, books, and other reference materials. This findings support a notion by Mohd Suki and Mohd Suki (2013). Smartphones are able to support a wide variety of applications that can be used by students in a field of engineering. Applications that are useful would enable undergraduates to research or calculate a wide variety of different materials, definitions, conversions, terms, interactions, translations and so on. Useful applications should either save time or minimize the number of mistakes, such as miscalculations (Young, 2010). With smartphones, this app allows future engineers, to have instant access to formula, dimensions, weights, and components without carrying around numerous books and tables. This notion supports that of Loo and Choy (2013) and Benson (2011)

Ownership of Tablets

Tablets were identified as the least popular technology owned. Tablets, as compared to laptops do not include ports, and this can significantly limit its overall functionality. A tablet may or may not have a video graphics array (VGA) port and without it, students will not be able to connect their tablets with other devices such as an LCD projector, camera or printer (Marwan et al., 2013). It is therefore difficult for undergraduates to conduct slide presentations and print out their documents.

Eventhough the popularity of tablets was low, results showed that more than a hundred undergraduates owned tablets and the majority of them were male undergraduates. This could be due to a few reasons. The main benefit of tablets is their portability (Singh, 2013). Laptops may weigh from 1.2 kg to a hefty 2.6 kg, compared to tablets which weigh less than 1 kg, depending on the model. This is a significant difference in weight, especially for male undergraduates who use motorbikes compared to female undergraduates who mostly use university transportation to and from the university. The slim profile of tablets makes them much more compact and easier to keep in tight spaces, example in students' backpacks.

In a nutshell, the choice of owning a laptop, a smartphone or a tablet had a lot to do with undergraduates' preference and the aspects that were most important to them. From the researcher observations and through personal experience, the researcher would seem to be in agreement that when users already possess a tablet or a smartphone, they may need a laptop in addition so that they can extend and use specific features which are not available in tablets and smartphones. However, laptops are meant be used without the need of other alternative devices. The researcher

also agrees that a tablet is considered as a leisure device and it is basically used for multimedia, internet browsing and gaming. This is supported by many researchers such as Manugerra and Petocz (2011) and El-Gayar et al. (2011).

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