Factors Influencing the Usage of Web 2.0 Technologies among University Students in Malaysia

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Abstract: The information and communication technology (ICT) revolution in twenty-first centuries has eventually led to the birth of Web 2.0 technologies. There are many types of Web 2.0 tools that can be used by students for learning purposes. However, previous studies found that a majority of students are passive users of online content construction tools. Instead, they typically use Web 2.0 for obtaining information. In addition, there are limited studies have been conducted on Web 2.0 usage in institutions of higher learning, especially in Malaysia. Therefore, this study aims to investigate the level of usage of Web 2.0 tools by students and assess the factors influencing the usage of Web 2.0 technologies in learning processes. This study adopts a quantitative research approach in which survey questions were given to 178 final year undergrad students. 127 sets of questionnaires were returned, for a 71% response rate. The results show that the level of usage of Web 2.0 tools by the students remains at an average level. By adopting the Decomposed Theory of Planned Behavior (DTPB), this study found that the presence of computers or portable devices, also Internet connection is the main factor that influences the students to use Web 2.0. Meanwhile, other students’ influence was found to be the least influential factor to use Web 2.0 in learning. Discussions are re-proposed in this study.

Key words: Web 2.0 · Students · Influential factors · Decomposed Theory of Planned Behavior · Malaysia

INTRODUCTION

The Internet is becoming vital worldwide and the changes it makes to human life have led to many debates, including education [1, 2] states that information resources from the Internet are unlimited. Thus, it has created a revolution in the education system upon the traditional learning environment in the classroom. Web 2.0 is an element that has coincided with the development of Internet and education [2].

Educational institutes in Malaysia were encouraged by the Tenth Malaysia Plan (2011-2015) to use ICT in teaching and learning processes by teachers and learners. Furthermore, the Ministry of Education (MOE) has expressed that all higher education institutions in the country should integrate ICTs into their lesson delivery. Blended learning is a common learning approach implemented by many educational institutions for the purpose of stimulating the use of ICT in education processes [3].

In support of Dasar e-Pembelajaran Negara (DePAN), Universities run courses through the New Academia Learning Innovation (NALI) Model that implement a blended learning approach [4, 5] defines blended learning as a new educational methodology combining e-learning with face-to-face learning methods, to produce the most effective learning system for education. Blended learning applies the use of technology in real classroom learning to enhance students’ learning outcomes [5].

There are many types of Web 2.0 tools available on the Internet that can be applied for the purpose of blended learning, including blogs, wikis, social networking and media sharing sites. However, over the years, many studies [6-8] have revealed that students are passive users of online content construction tools such as wikis. They are typically keen to use Web 2.0 for downloading or obtaining information. The studies conclude that students have yet to use the Web 2.0 tools to their fullest for learning.
Therefore, to overcome this issue, two objectives are proposed. First, this study aims to investigate on the level of usage of Web 2.0 tools used by the students for educational purposes. Next, this study aims to assess the factors that influence students to use Web 2.0 technologies in learning processes via DTPB.

The next section provides a brief literature on Web 2.0 and its impact on education as well as a discussion of the theoretical framework. The section is followed by an explanation of the research method employed in this study and the analysis of the result in detail. Implications and conclusion are presented in the last section.

**Literature Review**

**Web 2.0 Technologies:** Web 2.0 technologies were a turning point in the development of Internet technologies. The earlier generation of the World Wide Web, also known as Web 1.0, allowed communication to happen one-sided only, with data posted on websites and users simply viewing or downloading the content [9]. The latest version of World Wide Web or Web 2.0 is much more interactive. Users now play a significant role in the process of information building on the Internet, as Web 2.0 focuses on the ability for people to collaborate and share information online [10].

[11] stated that Web 2.0 then consisted of systems that broke the old model of centralized websites and moved the power of the Internet to the personal computer. However, the term Web 2.0 really began to popular in late 2004 from the Tim O’Reilly and MediaLive International Conference. [12] further describes Web 2.0 as the shifting trends in the use of World Wide Web technology and Web Design that proposes in enhancing creativity, information sharing and, most noticeably, collaboration among users.

**Web 2.0 Technologies and Education:** Adoption of Web 2.0 technologies has provided alternative ways for education, shifting the traditional culture of teaching and learning in the classroom to e-learning, a system that enables learners to learn anywhere at any time [13]. In this study context, four types of Web 2.0 application, which are blogs, wikis, social networking sites (SNSs) and media sharing sites have been considered. Table 2.1 briefly describes these tools.

<table>
<thead>
<tr>
<th>Types of Tools</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blogs</td>
<td>Discussion or informational site published on the Internet consisting of separate entries, or posts, typically arranged chronologically with the latest at the top [15].</td>
</tr>
<tr>
<td>Wikis</td>
<td>Websites that feature a loosely structured set of pages, connected in multiple ways to each other and to Internet resources and an open-editing system in which anyone can edit any content to any page [16].</td>
</tr>
<tr>
<td>Social networking</td>
<td>Websites that offer a virtual community to connect with other people, whether for business or commercial purpose, make new friends, reunite with old friends and long-lost relatives [17].</td>
</tr>
<tr>
<td>Media sharing</td>
<td>A group of Internet-based tools that build on the ideological and technological foundations of Web 2.0, which allow the creation and exchange of user-generated media, such as photos and videos [18].</td>
</tr>
</tbody>
</table>

**Theoretical Framework:** This research uses the DTPB as a theoretical framework to understand factors that influence the usage of Web 2.0 by the students. This theory is an extended version of the Theory of Planned Behavior (TPB) by [19]. Both DTPB and TPB posit that behavioral intention is a direct determinant of behavior. Both theories also view behavioral intention as a function of attitude, subjective norms and perceived behavioral control. Taylor and Todd (1995) further deconstructed attitudes, subjective norms and perceived behavioral controls into lower level belief constructs.

**Research Hypotheses**

**Attitude.** Attitude defines as the extent of a person’s feelings about acting out certain behaviors [19]. In this study, attitude refers to student feelings about using Web 2.0 technologies in their learning environment. Past studies [7, 20] have found a positive relationship between attitudes and behavioral intentions to use Web 2.0. About the DTPB, attitude is decomposed into perceived usefulness, perceived ease of use and compatibility [21] concludes that the higher the perceived usefulness, ease of use and compatibility of innovation, the higher the possibilities of an attitude towards the technology to be positive. Hence, the researcher proposes hypotheses H1, H1a, H1b and H1c, as shown in Figure 2.1.
Fig. 2.1: DTPB framework for factors influencing the usage of Web 2.0 by students
(Source: Taylor and Todd, 1995)

Subjective Norms. Subjective norms describe as the degree of perceived social pressure felt by a person to perform a specific behavior [19]. Prior studies [7, 20] have shown that subjective norms have a positive influence on students’ intentions to use technology. Each social group has different views and opinions on how they adopt and use the technologies. However, most of the time these social groups are proven to positively influence the subjective norms [21]. This study focuses on three reference groups, which are lecturers, other students and peers. The researcher proposes hypotheses H2, H2a, H2b and H2c, as shown in Figure 2.1.

Perceived Behavioral Control. Perceived behavioral control refers to one’s perception of the ease or difficulty of performing a behavior [19]. Intentions to use Web 2.0 would be greater to the extent that the students perceived that they have control over the utilization of the technologies [7]. In this study, perceived behavioral control is decomposed into self-efficacy and the facilitating conditions of both other resources and technology [21].

Higher self-efficacy to use technological applications is likely to lead to a higher level of behavioral intentions and actual usage. However, a lack of facilitating conditions may negatively affect the intention and usage of technology [21]. Therefore, the researcher proposes hypotheses H3, H3a, H3b and H3c, as shown in Figure 2.1.

Behavioral Intention: Behavioral intention is ballarconcerned with motivational factors related to students’ intentions to use Web 2.0 technologies in their educational environment. Due to the close relationship between intention and behavior, [22] used behavioral intention in predicting specific behavior. It is anticipated that there is a positive correlation between intention and the actual behavior of students in using Web 2.0 technologies. Thus, the researcher proposes hypothesis H4, as shown in Figure 2.1.

Methodology: This study adopts a questionnaire survey method as the research instrument to collect the data for the study. The questionnaire was developed from the literature [7, 20], but some questions were modified to suit
the context of this study. The questionnaires were sent to 178 final year undergrad students, but only 127 responded to the survey, for a response rate of 71%.

The data gained from the respondents were systematically processed using Statistic Package for Social Sciences (SPSS version 23) software and Microsoft Office Excel. Data in Section A and B were analyzed by conducting a simple percentage analysis. Data in Section C were processed using multiple regression analysis.

RESULTS AND DISCUSSIONS

Respondents’ Demographic Design: Table 4.1 shows that most of the respondents are female, with almost 87% of the total number of respondents. The remaining 13% of respondents are male. Additionally, most respondents are aged 21 to 22 years old, occupying 59.84% of overall respondents. Meanwhile, the remaining 40.16% of the total respondents are aged above 23 years old. In reference to Table 4.1, most of the respondents said ‘Yes’ to the familiarity of the term ‘Web 2.0’, indicating that they are very much aware of the use and existence of Web 2.0.

Furthermore, Table 4.1 shows that most of the students are using the Internet for social or entertainment for at least four hours daily, on average. Meanwhile, most of them were found to be using the Internet for learning purposes at the maximum of four hours, occupying 83.46% of all respondents. Overall, a majority of final year students was found to be using the Web 2.0 more for the purpose of entertainment, rather than for learning purposes.

Level of Usage of Web 2.0 Tools for Learning Purposes: Respondents were asked to mark on the appropriate statement that describes their level of usage of Web 2.0 tools, which include blogs, wikis, social networking and media sharing sites. Table 4.2 illustrates on the respondents’ level of usage of Web 2.0 tools for learning purposes.

Findings from the data collected highlight the fact that almost all respondents use blogs and wikis for learning at the level of ‘occasionally used and plan to use it occasionally’. Additionally, nearly all respondents indicated that they use social networking and media sharing sites frequently and intend to keep using them frequently in the future.

The results of the research indicate that most of the students regularly used blogs and wikis in their learning and intent to keep using them on a regular basis. This emphasizes that the final year students are not using the features of Web 2.0 technologies to their fullest in education. This statement is parallel to a study done by [6] which found that Malaysian students appear to be passive in the context of online content-construction, as they regularly obtain or download information from the Internet.

[23] highlight that students are facing some challenges in writing on the Internet. First, the students are experiencing difficulties in using content-generated tools, as their format is time-consuming to get used to. This major concern indicates that the tools have interrupted the learning experience of students. Besides, some students are resisting to try the online writing tools because they are used to the traditional methods of paper

<table>
<thead>
<tr>
<th>Items</th>
<th>Percentage (%)</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17 (13%)</td>
</tr>
<tr>
<td>Female</td>
<td>110 (87%)</td>
</tr>
<tr>
<td>Ages</td>
<td></td>
</tr>
<tr>
<td>21 years old</td>
<td>2.36</td>
</tr>
<tr>
<td>22 years old</td>
<td>57.48</td>
</tr>
<tr>
<td>23 years old</td>
<td>28.35</td>
</tr>
<tr>
<td>&gt;24 years old</td>
<td>11.81</td>
</tr>
<tr>
<td>Familiarity with term ‘Web 2.0.’</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58.27</td>
</tr>
<tr>
<td>No</td>
<td>41.73</td>
</tr>
<tr>
<td>Usage of the Internet for social/entertainment purposes, daily</td>
<td></td>
</tr>
<tr>
<td>&lt; 4 hours</td>
<td>38.58</td>
</tr>
<tr>
<td>&gt; 4 hours</td>
<td>61.42</td>
</tr>
<tr>
<td>Usage of the Internet for educational/learning purposes, daily</td>
<td></td>
</tr>
<tr>
<td>&lt; 4 hours</td>
<td>83.46</td>
</tr>
<tr>
<td>&gt; 4 hours</td>
<td>16.54</td>
</tr>
</tbody>
</table>
Table 4.2: Respondents’ level of usage of Web 2.0 tools for learning purposes

<table>
<thead>
<tr>
<th>Web 2.0 Tools</th>
<th>Don't use &amp; don't plan to use</th>
<th>Don't use but plan to use</th>
<th>Use occasionally &amp; plan to use occasionally</th>
<th>Use occasionally &amp; plan to use frequently</th>
<th>Use frequently &amp; plan to keep using frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blogs</td>
<td>35</td>
<td>20</td>
<td>47</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Wikis</td>
<td>5</td>
<td>4</td>
<td>56</td>
<td>37</td>
<td>25</td>
</tr>
<tr>
<td>Social Networking</td>
<td>2</td>
<td>3</td>
<td>14</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>Media Sharing</td>
<td>2</td>
<td>2</td>
<td>25</td>
<td>43</td>
<td>55</td>
</tr>
</tbody>
</table>

Fig. 4.1: Regression analysis of factors influencing the usage of Web 2.0

writing in the classroom. In other words, students are comfortable to be passive learners, in which it needs much effort to change them into self-directed students. Therefore, the lecturers could provide an introduction or exposure to blogs and wikis in their lecture to the students, so that they are aware of the existence of these tools for enhancing their learning environment.

Additionally, it can be summarized that almost all of the final year students reported being aware of the advantages offered by the social networking and media sharing sites could provide in improving students’ educational and learning environment. In other words, students do not just use these tools for the purpose of social interaction with others, but also for sharing knowledge online. With the existence of applications, like Facebook and YouTube, students are encouraged to share their information with other people on the web. This statement supports a report from the [24], which emphasizes that social networking and media sharing sites are some of the Web 2.0 applications that would positively affect higher educational learning system in five years to come.

Factors Influencing the Usage of Web 2.0 by the Students: Regression analysis has been conducted in analyzing data, in relation to research objective number two. The findings of the research are shown in Figure 4.1. Results from the regression analysis have accepted all hypotheses proposed by the researcher. This fact is illustrated by Figure 4.1, showing that all independent
variables in the model positively affect the dependent variable. Figure 4.1 also highlights on the fact that students are not greatly affected by the other students’ influence ($\beta = 0.059$) to use Web 2.0 in their learning environment. On the other hand, the presence of technology appliances ($\beta = 0.340$), such as computers, portable devices and Internet connections was found to have the greatest influence on the behavioral intention to use Web 2.0. This will eventually lead to the actual usage of Web 2.0 by the students.

Among the three factors that drive perceived behavioral control, facilitating conditions of technology reported to have a very strong influence on it. This result stresses that the presence of technology appliances, such as a computer or portable devices and Internet connection, would significantly affect student's intention to use Web 2.0. Other studies have supported this finding. [25] reported that the usage of technological devices provides positive reactions for learning, due to these devices’ portability and perceived convenience. Additionally, an Internet connection failure would eventually lead to the lost of interest by students towards technology. Consequently, students would behave negatively towards the use of Web 2.0 for the purpose of learning [26]. Hence, the faculty and universities in general need to step up their efforts and focus their attention on improving the quality of the technological facilities in every little corner in order to enable educational activities to be conducted.

On the other hand, students specified that other students’ influence is the least influential factor in encouraging them to use Web 2.0. This may due to the high degree of independence students have in their studying processes [27]. Other students explain why competition for student quality is increasingly fierce nowadays. However, if the classroom environment itself does not adopt Web 2.0 as one of its educational problem-solvers, then students may feel that there is no urgency for them to use the technologies to enhance learning quality. Therefore, students are encouraged to diversify their sources of information by implementing Web 2.0 into their learning processes. This will raise value to students and at the same time improve the classroom environment.

CONCLUSION

In conclusion, this study found that the involvement of the students with Web 2.0 tools is at an average level, as they are focusing more on adopting social related tools in their learning. Additionally, findings from the research found that facilitating conditions of technology are the most influential factor affecting behavioral intention of students to use Web 2.0, eventually leading to the actual usage of the technologies. Meanwhile, the least influential factor affecting behavioral intentions to use Web 2.0 was found to be other students’ influence.

With the existence of this research, it can provide benefits and impacts to some parties. Students are encouraged to diversify their sources of information by implementing Web 2.0 into their learning processes to raise the students’ value and at the same time improve the classroom environment. Instead of just focus on social-related tools, students could diversify the use of applications to the content and material construction tools, such as Blogs and Wikis. Additionally, from the educator and administrators’ perspectives, this study could give an exposure on the usage of Web 2.0 by the students in their study. This may help in encouraging new ways of teaching and learning. As the Internet connection is found to be a very important element in using Web 2.0 tools, the first step that could be taken by the Faculty and University is improving the Internet and Wifi facilities in every little corner that enables the educational activities to be conducted.

However, there are some limitations of this study. Future researchers are recommended to diversify the research instrument adopt for the purpose of the research. A variety of research instruments could strengthen the findings of the research and preventing from errors. Furthermore, future research can put an effort to consider involving students from information technology courses and analyze the difference in factors that influence both courses to use Web 2.0 technologies. The advantages possess by the students from information technology courses could be taken into account to overcome the problem facing by the comparing courses. Future research also could include the University perspectives regarding the usage of Web 2.0 among students. The problem facing by students on the Internet connection is not new and until currently, no improvement has been done by the University. Clarification from them need to be assessed for the sake of the audience.

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