

An Exploration of Social Media Technologies and Their Potential Uses in Higher Educational Institutions: A Case Study of Universiti Teknologi PETRONAS

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Abstract—Even though many Higher Educational Institutions (HEIs) have started exploring the use of Social Media Technologies (SMTs) such as instructional blogging, wikis for collaborative content creation and podcasting for video and recording of instructional elements for teaching and learning, there has been little adoption and use of SMTs in the context of Malaysia higher educational institutions. The aim of this research is to establish current educators' and learners' contexts, practices, attitudes and prospects for the use of SMTs in teaching, learning and research within HEIs using Universiti Teknologi PETRONAS (UTP) as a case study. The research was conducted using a mixed-method approach to investigate the use of SMT and the main findings are presented.

Keywords— *Social media technologies; frameworks; mixed-method; learning management system; e-learning 2.0; synchronous; asynchronous*

I. Introduction

Institutions that can provide teaching and learning resources electronically to educators and learners will gain enormous competitive advantages. Social media gives an institution the tools and capabilities to accomplish this goal. Social media is defined as web services that receive most of their content either directly from users' contributions or as feeds from other websites, with an emphasis on one to many communications. 'Social media' is a term that focuses on the nature of user-generated content and the active social roles related to the production and use of such content [1]. Rodriguez defines social media as "a group of internet-based applications that are built on the ideological foundations of web 2.0" [2] for users to create and exchange content.

Social media is one of the buzzwords which emanated along with web 2.0 technologies in 2005. Their importance in education cannot be over emphasized. They are valuable tools in teaching, learning, and research. They allow users to participate, collaborate, exchange ideas, and create everlasting

social relations among learners and between educators and learners. With social media, users can either generate (user-generated content) or create content (user-created content) of their own or import it from different websites (user-driven content) and these content can be made available to the creator's social network of people. [1, 3-5].

Social media enhances traditional in-class learning, supports distance learning, can be used for official correspondence, assignment submission, and urgent queries. They are also employed in school admission processes and in alumni meetings and discussions. Social media tools have dramatically improved communication among professionals in education from "unidirectional to multidirectional" [2].

In addition, social media can be used to support group work and also provides opportunities to support students with their independent research [3, 4]. Furthermore, they help to develop and enhance learner confidence and prepare them for future technology. They help to reduce teacher-student ratio [6].

Most importantly, they offer assortment of tools that learners can mix and match to meet their individual learning style and has support for cognition, socialization, collaboration, interaction, meaningful knowledge construction, and 24/7 learning environment [2]. They also enable the introverts, the isolated and shy students to have confident and express themselves freely online and make their own contribution. In addition, the use of SMTs in education will enable users to acquire skills like "critical thinking, good communication, collaboration, problem solving, independent or lifelong learning, information literacy and creative innovation" [7]. The above benefits will help select important features when designing and developing educational software.

Despite the above benefits of incorporating SMTs for teaching and learning, there has been little adoption and use of SMTs in the context of Malaysia HEIs. To support this argument, a literature review by [8] revealed that the adoption of social media for collaborative teaching and learning is slowly emerging and in most cases at experimental stage.

Thus, the main reasons why teachers may not incorporate technologies into teaching include; lack of incentives, vision and personal experience as well as exiting teaching culture.

This paper is part of ongoing research on the topic, e-collaboration through social media: a conceptual framework for effectiveness and didactic enhancement. Currently, the main objectives is to establish educators and learners contexts, practices, attitudes and prospects for the use of social media technologies in teaching, learning and research within UTP. The research also aimed at investigating the teaching and learning process facilitated by SMT.

The following questions was addressed by the end of this research; What are the educators' and learners' current contexts, practices, and attitudes towards implementation, adoption and use of social media in teaching, learning and research within Universiti Teknologi PETRONAS (UTP)? The second question is how does social media influence teaching, learning and research in the 21st century? Finally, what are the current teaching styles and mode of assessment at UTP?

II. Related Work

A. Supporting theory

The pervasiveness and evolvement of web technology have led to changes in the theoretical views of teaching and learning. A key change is from the initial view of learning as the "transfer of knowledge from teachers to learners to a knowledge economy" [9] where learners actively participate in the construction of knowledge. The supporting theories in this regard include constructivism, socio-constructivism and media synchronicity theories.

1. Constructivism theory

In a constructivist perspective, knowledge is not passed but must be built, either through practical components (learning by doing) or by social interactions (learning with others) [10]. The belief is that learners construct their own knowledge through their past experiences; this then has to be built upon. Realistic settings have to be used and learning has to be a collaborative process. According to Gold constructivism, is "less content-oriented and more learner-centered" [11]. The theory also define role of stakeholders; While the goal of the designer is to create a rich, socially meaningful and collaborative environment, the instructors is to encourage the learner to "interpret, analyze, and predict information" [11] through "facilitative questions" [11]. He is also to facilitate, guide, encourage and mediate the learning processes.

This means that an educational experience has a dual purpose to construct meaning and to collaboratively refine and confirm it using a community of learners. The environment must, therefore, allow for independent and collaborative learning. In such an environment, teaching and learning should have a dynamic balance of responsibility (cognitive and social conditions) and control issues regarding educational

and curriculum design [12]. Therefore, knowledge must be socially constructed by learners and that process should be interactive, social, contextual and reflective [13].

2. Socio-constructivism

This theory proposed by Lev Vygotsky extends constructivism into social settings for collaborative co-creation of knowledge. It emphasized the critical importance of culture and the importance of the social context for cognitive development. Learning, then, is primarily a process of enculturation into a community of practice. He proposed the zone of proximal development (ZPD) [14] concept, which argues that students can, with help from adults or children who are more advanced, master concepts and ideas that they cannot understand on their own.

3. Media synchronicity theory

The theory ascertains that the capability of media should support synchronicity (a state in which individuals are working together at the same time with a common focus). The theory suggests two processes of communication to be conveyance (the transmission and the processing of information by the receiver) and convergence (the process of mutually agreeing or disagreeing on the meaning of the information). Thus, effective communications involve conveyance of knowledge and skills from the sender to the receiver and the resulting convergence between them. Therefore for a giving media to function effectively, it should have the following five capabilities; transmission velocity, parallelism, symbol sets, rehearsability, and reprocessability. This means that a single medium may not meet all the five dimensions but a combination of media. This theory will be important in the selection of SMTs for developing e-learning [15].

B. Practical Uses Of Social Media In Education From Other Countries

Social media are widely gaining importance in some HEIs. They are becoming pervasive and powerful tools in education resulting in extensive research on how to incorporate them into the educational arena to realize learning. As a result, many HEIs are implementing and experimenting with social media as study media within an existing LMS or as a new project. The importance has resulted in a "mainstream e-learning project" [1] taking place in each of a number of HEI such as "Johns Hopkins University, Harvard University, University of Notre Dame, Ohio State University, Columbia University in the city of New York, and the MSc in eLearning program at the University of Edinburgh" [1]. These schools are employing a suite of social media for collaborative work among students and educators. For instance, "Students use reflective blogs to track their own development throughout several modules; Wikis form the assessed coursework for some modules and tutorials and discussions via Twitter and Skype. In addition, film festivals took place through YouTube. Second Life is used for students to feel part of a tangible community" [1].

In addition, Popescu and Cioiu have developed and evaluated what they termed eMUSE, this was developed using social media technologies by means of mashups [16]. The environment encompasses useful features like learner tracking functionality and a common access point for tool management; this makes for easy monitoring, visualizing and grading of each student's contributions. The evaluation of eMUSE by comparing it with a similar application and through the experimental analysis of 45 students revealed positive results ('successful,' 'motivational,' and 'will want to use it in the future' being indicative terms).

Drážil and Pitner, on the other hand, implemented what they termed a learning landscape (L2) by incorporating the needed e-learning 2.0 resources that support the creation of learner communities, knowledge sharing using blogs, bookmark databases, and tagging [17].

Another study by the University of Massachusetts Dartmouth Center for Marketing Research [18] analyzed the trends of social media adoption among four-year accredited institutions in the United States for the 2010-2011 academic year; it revealed that, "100% of colleges and universities studied are using some form of social media" [18]; "Facebook, YouTube, Twitter, blogging and podcasting" [18] are the most used SMT for US HEIs; Facebook is the most used of the SMTs; LinkedIn is the most used for admissions purposes, marketing and recruiting plans; Some schools and colleges also use blogs.

The above clearly indicate how other schools are incorporating SMTs into teaching and learning and how it will eventual benefit our research in terms of success and unsuccessful factors of their evaluations.

C. Practical Uses Of Social media in Malaysia HEIs

Even though many HEIs from other countries have started implementing and experimenting the use of SMTs for teaching and learning, limited implementations and experimentations have been carried out from the context of Malaysia.

Zakaria et al., in 2007, researched how Malaysian students would support the use of Web 2.0 technologies in the classroom [19]. Their findings demonstrated that students are somehow familiar and comfortable to learn using Web 2.0 applications. Their results also indicated that Malaysian students are active contributors, but passive in the construction of knowledge.

In addition, Tulaboev and Oxley, in 2010, carried out a pilot study on UTP students' use of web 2.0 to aid academic writing skills [20]. The study revealed that students find web 2.0 tools to be an acceptable means for improving their studies and find them easy to use. In 2012, the same writers studied and experimented with the application of Facebook to a final year course. The study revealed that Facebook helped learners to connect, share content and aid in their collective learning [21].

Kabilan et al., in 2010 [22], investigated the use of Facebook in learning of English Language among undergraduate students at Universiti Sains Malaysia, Penang,

using a survey method. The researchers findings revealed a more positive result to the use of Facebook for the learning of English, but emphasized that educators have to adopt and integrate Facebook within educational curriculum [22].

Song and Chan, in 2010, explored Malaysian students' perceptions and experiences in blogging, focusing on Multimedia University [23]. Their findings revealed that blogging as a learning tool is well accepted among the students, but there are some challenges associated with the learning culture and aligning the tool with the existing curriculum.

Comparing practical uses of social media in education in other countries with that of Malaysia, it can be realized from above discussions that the research currently available in Malaysia mostly involve a single SMT and most schools have not developed, implemented, or evaluated SMTs in teaching and learning leading to difficulties in finding literatures to further support this debate. This therefore calls for support for this research which further aim at developing framework, implementing and evaluation of SMTs within HEIs.

III. Methodology

Data for this research was collected using mixed-method approach by adopting a combination of literature analysis, semi-structured interviews, and questionnaires. Having a mixed-methodology allowed the authors to view the research topic from different angles and viewpoints and to help produce a multifaceted set of data. Employing different methods also helps to validate the findings. According to [13], the Pragmatism (Mixed Method) Framework uses mixed data (i.e. both qualitative and quantitative) together with various techniques and methods. Proponents of this framework ascertain that a single scientific method is not enough to make accurate investigation [13].

Thus, after a systematic search and review of literature from sources like well-recognized articles, journals, books, and official websites, semi-structured interviews were conducted. The interviewees were lecturers from UTP who have been teaching for over ten years. Their thoughts on SMTs in teaching and learning and on extending the current e-learning system to include SMTs were investigated.

Finally, a questionnaire instrument was then designed consisting of 24 questions. A copy of the questionnaire was then distributed to each of 150 undergraduate students of various faculties and departments in UTP using stratified and random sampling techniques. 102 sets of responses were returned of which only 87 sets contained valid and usable responses. Both questionnaire and interview guide was used to explore students' and lecturers' perception, awareness, use, and support for social media technologies. The data gotten was then analyzed using the SPSS statistical tool. The results are as presented below.

IV. Results and Discussions

A. Qualitative Findings from Interviews

The interviewer was able to interview lecturers based on their availabilities and willingness during the interview period. The lecturers were of the view that the UTP LMS incorporates only one type of social media, a blog. Currently, the system is not collaborative in nature, and is used by lecturers to post lecture notes and other files for teaching and learning. This finding contradicts the current view of learners as co-creator of contents. One of the interviewees, however, stated that he is currently using Facebook and a mashup, from post graduate students' projects, in his course. These findings among others facilitated the development of the survey instruments for the quantitative research to ascertain students' perspective.

B. Quantitative Findings from Questionnaires

Figures 1 and 2 summarize respondents' gender and department. These represent undergraduate students, 26.44% of whom were female and 73.56% were male. The highest number of the respondents, 32.1%, came from the Petroleum Engineering department, followed by Mechanical Engineering (26.44%), then Computer and Information Sciences (25.29%) and finally by the Civil and Electrical Engineering departments (8.05% each).

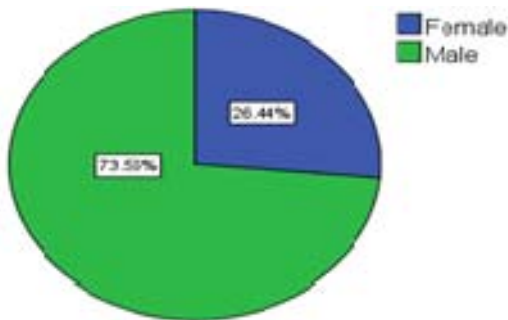


Figure 1: Respondents by Gender

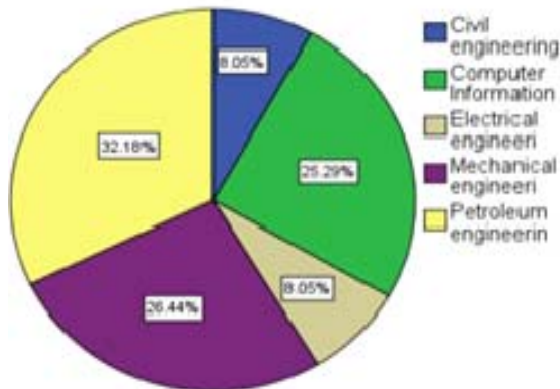


Figure 2: Respondents by Departments

Table 1 show that the main UTP instructional method is face-to-face supported by technologies like projectors, computers and LMS; the university has not fully adopted social media for teaching and learning. 76 out of 87 valid questionnaires supported this, making a total of 87.4%. The current LMS is said to serve as a platform for information and content sharing. Most of the students and lecturers are, however, familiar with social media tools and they believe that if lecturers could incorporate them into teaching and learning activities it would lead to better collaboration, improved learning, and improved research, would provide access to a wide range of sources of information, would lead to effective communication, and would be entertaining.

Teaching Style	Frequency	Percent
Face-to-face instruction with technology	76	87.4
Face-to-face instruction without technology	2	2.3
Face-to-face with online materials	4	4.6
Face-to-face with web tools	2	2.3
None of the above	3	3.4
Total	87	100.0

Figure 3 shows the challenges faced by learners in using the current LMS (e-learning). The biggest problem is poor accessibility, followed by poor feedback and response time, uninteresting content, and lack of content, among others.

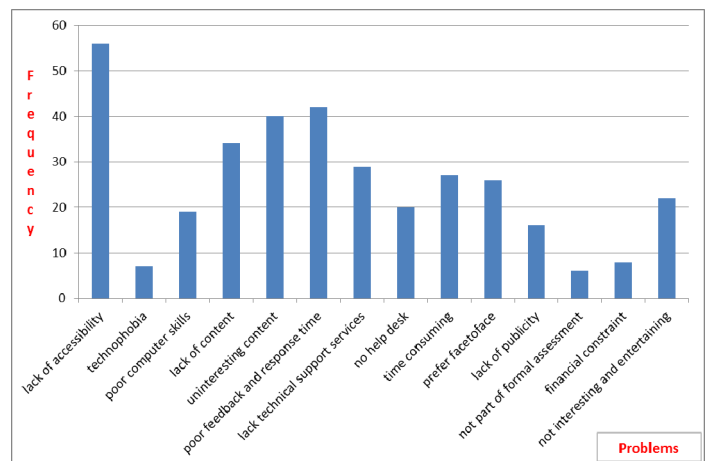


Figure 3: Challenges Faced with Current LMS

Regarding the benefits of using social media in teaching, learning and research, 50 out of 87 valid respondents, as indicated in Figure 4, believe that SMT could make it easier to find information, other findings include serving as wide sources of information, improve learning, collaboration, saves time, fast, and global.

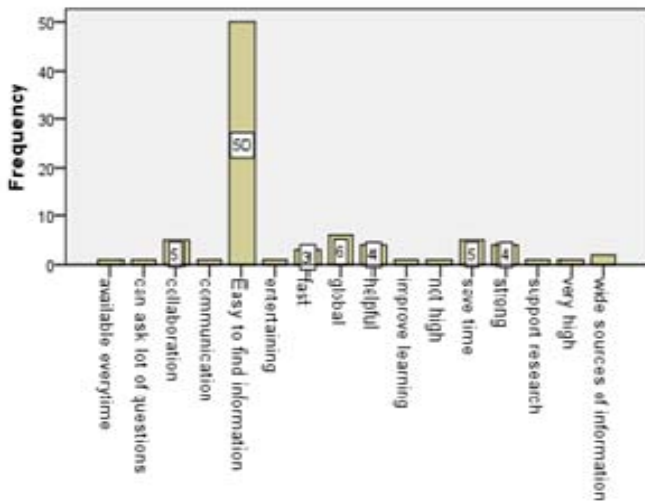


Figure 4: Benefits of Using SMT in Education

The majority of respondents, 74 out of the 87 students, representing 85.1%, would like to use social media in learning and research in the future, as it's shown in Figure 5. Some of these students are already familiar with social media technologies such as Facebook, chat, and YouTube as they use them in contacting and connecting with friends and family.

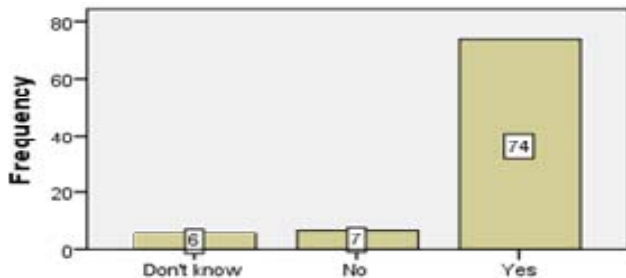


Figure 5: Plan to Use Social Media in Future

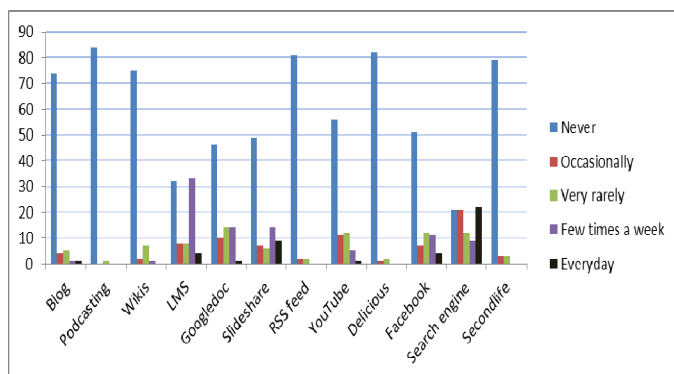


Figure 6: Students Current Experience with Social Media Tools in Teaching and Learning

Figure 6 illustrate that many students have never used well known SMTs such as educational blog, podcasting,

wikis, second life, RSS feed, etc. for learning. While search engine is moderately used, others like Google docs, LMS, slide share and YouTube are used few times a week.

Thus, in future, students would like to use the following SMTs as illustrated in figure 7 in learning, research and teaching.

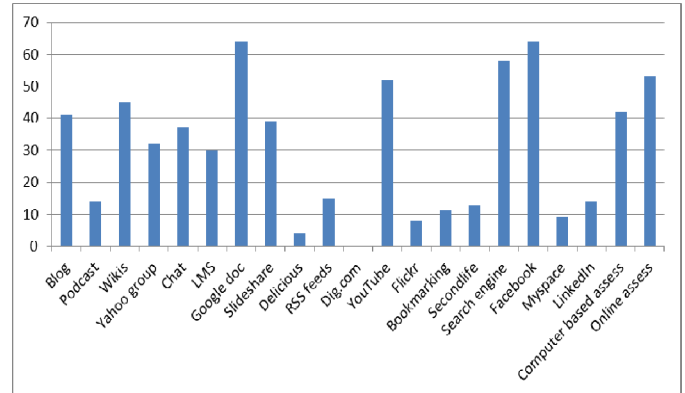


Figure 7: Students Suggestion for Future use of SMTs

Figure 8 also depicts the mode of assessment of students in UTP. This indicates that 64 respondents out of total of 85 have never used both computer-based assessment and online-based assessment - that is 28 and 36 respectively. Other findings are as illustrated.

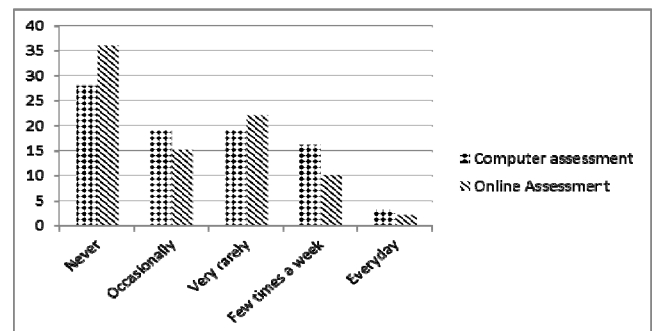


Figure 8: Mode of Assessment in UTP

v. Conclusions and Future Work

Social media technologies are valuable tools when incorporated into teaching and learning; it is of no doubt that higher educational institutions are embracing it. The incorporation of SMT in education is termed e-learning 2.0. The blend of this model to teaching is termed blended e-learning and the benefits are numerous – it allow students collaboration, increase students' participation in teaching and learning, allow self-organized learning, discussions, group work, content creation and sharing. It allows lecturers to monitor, visualize, and grade.

The survey undertaken at UTP, described earlier, cuts across every department. The data obtained provides some

highlights into how teaching and learning takes place and, more importantly, into how students have been using SMT for personal, informal and formal learning. Most of the respondents responded positively to the integration of SMT in teaching and learning. Figure 3 also indicated some of the challenges with the current LMS which include poor accessibility, followed by poor feedback and response time, uninteresting content, and lack of content, among others. Some students are also unfamiliar with some SMT; this calls for initial training of technologies before their actual integration.

The results however suggest that there is hope for implementation and integration of SMT in Malaysian HEI to help achieve similar benefits to those encountered by their counterparts from other countries. This also calls for better didactical and pedagogical strategies to be employed by educators since they are important factors in ensuring that teaching and learning using this approach yields the intended benefits.

This current research is significant to the world of knowledge and Malaysian Higher Educational System specifically in the field of e-learning and its related branches. It also contributes to the current debate on the role of social media technologies in teaching, learning and research as well as for effective collaboration. It helps to investigate the demand and need for incorporating SMT into teaching and learning. It further posits that other similar studies should be encouraged to achieve maximum results. However, one limitation of this research is the inability to interview many lecturers to support ongoing debate.

This paper is part of ongoing research on the topic, E-Collaboration through social media: A conceptual framework for effectiveness and didactic enhancement. Our future research will answer the question, What is the pedagogical and didactical rationale for collaborative learning using SMTs? The researchers will also establish a conceptual framework for constructivist didactic, focusing on collaborative environments. Finally, a prototype will be developed using the conceptual framework and empirically tested.

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