THE PERCEPTION OF UNDERGRADUATE STUDENTS STUDYING STATISTICS ON WEB 2.0-BASED USAGE OF SOCIAL MEDIA TECHNOLOGIES IN THEIR PERSONAL LEARNING ENVIRONMENT

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Abstract

The main purpose of this paper is to examine the use of online learning tools as a Personal Learning Environment for self-regulated learning for a statistic course. This study was carried out on students at a private university in Malaysia. This paper examines the data collected in a pilot study. The preliminary analysis of the data will be used to refine the questionnaire for a full-scale study. The data collected was processed and analysed using SPSS. The study's results indicate many learners are connected with the internet but not many use it for learning purposes. Using social network for learning is found to be correlated with a stronger intrinsic motivation. Instructors have to adopt an attractive and innovative social media content that is integrated in the Learning Management System. The results show that learners prefer a blended learning method with both online and offline formats. The implication– of this results is that there is a growing trend of the use of social media in learning, and at the same time there is still a demand for the conventional offline approach where there is an indication that a blended learning approach is still a better option.

Key Words: Personal Learning Environment; Social Media; Statistics; Internet.

Introduction

Mathematics is viewed by learners as one of the most challenging subjects. The balance struck between the two teaching and learning approaches of constructivist and instructionist can be supportive of the learning process (Belbase, 2013). Among others, the learning of science needs to focus on argumentation structures that will allow students to exercise the mastery of scientific argumentation. This is needed for nurturing the students' reasoning skills and content knowledge (Lee, Surif, Cher & Ibrahim, 2015). In Malaysia, two dominating themes of statistics learning are technology integration, and affective measures (Reston, Krishnan & Idris, 2014).

In a study on science learning outcomes, Murugan (2013) found that female students achieved better than males in their mathematics assessment. On the other hand, Talib, Wong, Azhar and Abdullah (2009) argued that students preferred to have extra classes to make them disciplined learners. De Witte, Haelermans and Rogge (2014) too argued that Computer-assisted instruction (CAI) programs provided more exercises and led to better mathematics results. Particularly, Mji and Makgato (2006) found pedagogical content knowledge to be an important aspect towards improving performance in subjects such as mathematics. Some authors for example Oates (2009) suggested that technical subjects cannot be totally conveyed via online classes. However, Weems (2002) and Ryan (2001) concluded

that no significant difference in achievements was noticed regardless of whether or not the students integrated technology in mathematics learning. Haapala et al. (2002) reported on factors which needs to be considered to achieve the learning outcomes. Cruise and Bolton (1985) reported on anxiety in taking the statistics course among students. Statistics anxiety was linked to procrastination (Rodarte-Luna & Sherry, 2008).

Makwakwa (2012) suggested the probable reasons of learners' difficulties, in terms of difficulties using graphs to predict results, identifying functions that best fit the data, and answering questions with the ogive graph. According to Segaren (2019), students were finding it challenging to grasp Management Mathematics and Statistics courses due to their past negative experiences with Mathematics or lack of self-confidence towards the subject. Furthermore, the negative attitudes towards the subjects are extremely difficult to alter (Birenbaum & Eylath 1994). Students who perceived mathematics ability as static and students who considered the subject as posing a threat to their self-worth are the least likely to ask for help (Hashim et al., 2004). In effect, older students showed significantly higher statistics test scores compared to younger students, and the former also showed more positive attitudes toward the usefulness of statistics (Baloglu, 2003). Consequently, students need to be motivated that the subject is important and would be helpful in their future vocation.

Universities are administrating the Learning Management Systems (LMS) to enhance learning (Pilli, 2014). There are free of charge or paid e-learning platforms (Bruno & DeNotaris, 2013). Innovative technologies represent something closer to personalized learning (Wilson et al., 2006). Statistics is an essential course for business students, but they face challenges in learning the subject due to the subject's complexity and the lack of self-motivation and support.

Literature Review

Teaching aids need to be accepted as they can affect the outcome in terms of the students' results. Baker and Sugden (2003) mentioned that the spreadsheet was likely becoming a universal tool for mathematics. Particularly, Lee and Rha (2009) demonstrated that students exposed to interactive materials achieved higher scores. The findings of Al-Rahmi, Othman and Yusuf (2015) showed that the facilitation of social media in learning and engagement did improve the academic performance of the students.

In 2010, the Ministry of Education of Malaysia allocated a fund for the subscription of netLibrary in universities (Letchumanan & Tarmizi, 2011). However, the attitude and the intention to use the e-books were found to be moderate (Jalal, Ayub and Tarmizi, 2013). Therefore, instructors need to consider the design of the e-book when embracing e-books as instructional materials (Lim, Hong & Aziz, 2014), in a way that instructors can customize the e-books (Wong et al., 2011) such as the adoption and use of the Hyper Text Markup Language (HTML) compiler (Lai & Newby, 2012) on the e-books. Consequently, the use of the collaborative multimedia tools has sparked interest among the learners and instructors and subsequently improve the examination results.

In web-based learning, the learners must adapt to a structured learning environment without direct instructions. This is because students who registered in web-based courses in a conventional curriculum would have to perform the same duties and tasks as those students in the conventional teaching space; however, the disturbances they faced tended to be quite different. Chang (2005) also reported that students enrolled in web-based courses adapting to the self-regulated learning strategy had positive orientations and they became more self-directed, as compared to those without the self-regulated learning strategy instructions. In conclusion, web-based learners are generally self-regulated and self-directed and they tend to have a positive motivational orientation.

Dabbagh and Reo (2011a) defined the social media as a variety of networking tools or technologies with Web 2.0 and social software such as SNS (social networking service) including LinkedIn and Facebook, the social media, web-based office tools, wiki software and media sharing tools (Dabbagh & Reo, 2011b; Kitsantas & Dabbagh, 2010). Siddike, Islam, and Banna (2015) reported their results that Facebook and Google+ were the preferred SNS. As of 31 December 2015, Facebook has 1.59 billion monthly active users and on 27 August 2015, it passed an important milestone with over one billion people using Facebook in a single day (Facebook, 2016).

Mazman and Usluel (2010) explained that the three major usage of Facebook for educational purposes are communication, collaboration and sharing materials. Essentially, the use of Facebook leads to interaction that satisfies the students' higher-level information and decision-making needs (Ahern, Feller & Nagle, 2016). Nevertheless, engagement for meaningful academic conversations on Facebook depends on the timing as well as the topics of discussion (Lim, 2010).

Furthermore, EDUCAUSE Learning Initiative (2007) reported that social media had been used by many college faculties for teaching and learning activities. Results from Kwok and Neo (2015) also showed that the students enjoy using the blogs as their learning tool in Malaysia. On the other hand, Twitter is very effective for student engagement in the classroom (Rankin, 2009) where students can tweet and communicate among themselves. Besides, Wiki (e.g., PBworks) allows students to create, edit and manage content which is much more suitable for project collaborations (Hazari, North, & Moreland, 2009). Furthermore, effective online collaboration needs group trust mediated by communication media and group interactivity (Du et al., 2018).

Before implementing the social media learning, training must be provided sufficiently. Teaching materials must be accessible to students as well as the fact that sufficient groundwork must be laid for the adoption of social media learning (Khwaileh, F.M. and AlJarrah, A.A, 2010). Hashim et al. (2015) found that 70% of lecturers from an institution of higher learning used social media for teaching purposes and most of whom are early adopters. According to Moran, Seaman and Tinti-Kane (2011), more faculty members are adopting social media with YouTube videos in teaching. Especially, the male teachers appeared to be more receptive towards mobile phones usage at school (Ismail, Bokhare, Azizan & Azman, 2013).

Findings from Lim, Agostinho, Harper and Chicharo (2014) showed that students have started to use social media technologies. On the other hand, results from Abachi and Muhammad (2014) indicated that learners and educators are in favour of the utilization of m-technology although there are security and coverage concerns of its utilization in an educational environment. According to Hong, Tan and Lai (2009), the online social constructivists' mathematical problem-solving course benefits the trainees. Even though there are advantages and issues in the use of social media (Hoffman, 2009), however, the educational aspect of social media still needs further investigation (Lee & McLoughlin, 2010). The results of Akanbi and Theophilus (2014) showed that there is a positive correlation between social media usage and self-image. The results of Wanda's study (2014) showed a positive significant relationship between variables in the use of social media for academic purposes. Similarly, the results from Ismail, Idrus, Ziden and Rosli (2010) indicated that mobile learning has helped students in their studies. Furthermore, the SMS educational content received through their mobile phone tends to be easily remembered. The results of Almu and Buhari (2014) revealed that, the mobile social network affects most of the students' performance, especially those that cannot spend even a day not visiting the websites. The collaborative learning on social media through the engagement and interaction of peers and teachers was found to positively impact the students' academic performance (Al-Rahmi and Othman, 2013).

On the other hand, based on Martin (2009), those students heavily participating in social networking showed good performance compared to students who are less attracted to it. Respondents with more initial computer skills were found to demonstrate better performance in mathematics (Hong, Tan & Lai, 2009).

Social Media and Personal Learning Environments (PLEs)

PLE can be defined as tools, communities or services that constitute personal or own learning educational platforms to pursue educational goals and take charge of one's own learning. (The EDUCAUSE Learning Initiative (ELI), 2009; Rubin, 2010 and Lee and McLoughlin, 2010). In other words, students design their own learning pedagogy with the support of the technology (Johnson, Adams, & Haywood, 2011). Personal Learning Environments are claimed to be an outcome of the use of social media (Martindale and Dowdy, 2010). Nevertheless, Tawil et al. (2013) revealed that students preferred to study in a conventional learning style, and more activities were required to enhance the e-learning system in the learning of mathematics.

With technology that supports teaching and learning, many social media products have emerged which constructed some new ways of teaching and learning. The additional Web-2.0 social media technology contains user-generated content, openness, collective wisdom, personalization, social networking, collaborations, social presence and social networking. For instance, classroom 2.0, faculty 2.0, pedagogy 2.0, e-learning 2.0, student 2.0, web 2.0 are the demarcating areas of higher education that has contributed to a significant transformation of practices in teaching and learning carried out by faculty staff and students (Alexander, 2006; Dabbagh & Reo, 2011b; Jones, 2008; Lindstrom, 2007; Norton & Hathaway, 2008; O'Reilly, 2005; Sessums, 2006). For instance, Hilton (2009) pointed out that higher education is soon going to be the Web 2.0 technology, especially when social media has no intermediary between thinking, work, knowledge or publication due to self-learning. Therefore, social media provokes a number of challenges on pedagogy and practices, as well as the fact that the PLE concept has a great impact on learning and teaching (John, Adams, & Haywood, 2011). From the viewpoint of the learners, Latif et al. (2006) stated that learners who are classified as high achievers are more optimistic towards e-learning as opposed to the low achievers.

In the area of learner control and personalization, PLEs are becoming more successful in the e-learning field as they are often lacking in formal Learning Management System (LMS). According to Ng, Omar and Mohamed (2012), the successful adoption of e-learning is found to be contributed by attitude, university support, trialability, relative advantage and self-efficacy. LMS was originally a flexible framework but recently research has shown that LMS is used to broadcast information and was also used to encourage students' involvement and communication (Harasim, 1999; Harvey & Lee, 2001; Hedberg & Harper, 1998; Marra & Jonassen, 2001; Oliver, 2001). One of the downsides of LMS is that the learners are restrained the rights to administer and direct the learning space and their own learning actions. Whereas, technologies in the Web 2.0 era allows learners to form lunchtime discussions, study groups, brown-bag session, student organisations and informal learning activities through the use of social media.

Informal learning supported by social media has become an important element in home-based education (Selwyn, 2007). The engagement of learning activities becomes most effective when they are both connected and optimized (Hall, 2009). Web 2.0 technologies would increase students' informal learning at the same time when PLEs are regarded as a promising pedagogical method for the incorporation of formal and informal learning areas.

Specifically, authors such as Dabbagh and Reo (2011a), Turker and Zingel (2008) suggest that PLEs necessitate the growth and use of learning skills that are self-regulated because PLEs are constructed bottom-up. Dabbagh and Fake (2017) report on students' expectations of digital tools for learning which involves collaboration, organisation, experiential learning and personalisation.

Perceived Intrinsic Motivation

Based on Wang et al. (2012) the stronger the intrinsic motivation, the more probable he or she is to comprehend that he or she is part of an online community. It is also possible to see that motivation becomes more important to students' success in this setting rather than in a conventional classroom setting. Self-efficacy is an aspect of motivation in online learning for mathematics that may be lacking in the online developmental mathematics course for students. According to Bandura (1997), self-efficacy is the belief in one's capabilities to organise and execute the resources required to manage potential conditions. According to Bandura (1993) and Schunk, and Gunn (1986), self-efficacy is impacted by the feedback they obtain and the attributions they make of that feedback. In a perfect online classroom, students will come across many feedback tools that are obtainable to them. Nevertheless, without the face-to-face interaction, there may be substantial challenges in interpreting and/or using the said feedback.

Perceived Support

In the last decade, Chong et al. (2010) found that the use of computer in learning mathematics was still at a minimum. Nihalani and Mayrath (2010) suggested usage of iPhone and iPod touch applications in education. The findings from Bozkurt, Karadeniz and Kocdar (2017) indicate that the social networking sites (SNS) can be applied to support social learning processes in innovative method (Karpinski & Duberstein, 2009). Specifically, Twitter also allows and support to access videos (Mistry, 2011). Overall, Mills, Knezek and Wakefield (2013) developed an assessment of students' perceptions on social media application to support learning in the university. According to Yang (2012), students trust that m-learning supports collaborative learning.

Perceived Satisfaction

Yu et al. (2010) opined that social network sites could create satisfaction and affiliation in peer learning. Karunasena (2015) suggests that online learning interactions develop the students' sense of belonging and satisfaction. Cao and Hong (2011) reported that perceived student satisfaction and student learning outcomes were important in assessing the outcomes of social media in teaching. Similarly, Sulisworo and Permprayoon (2018) found that satisfaction, usefulness, ease to learn, and ease to use were the main factors of the social media learning model. Wilson (2017) also argued that further examination is required on the impact of the PLE features on the learners' satisfaction.

Pedagogical Model

The instructors use presentation slides to teach. These materials and discussions are made available in the LMS.

Figure 1 shows the teaching pedagogy model. The students from a private university are able to reach its LMS anytime and anywhere. During the lecture, lecturers use videos from YouTube as a valued way to facilitate learning. Besides instructors-peers' interactive forums in the LMS, the students set up Facebook groups for collaborative group assignments. They share information related to their work and communicate the progress in the group.
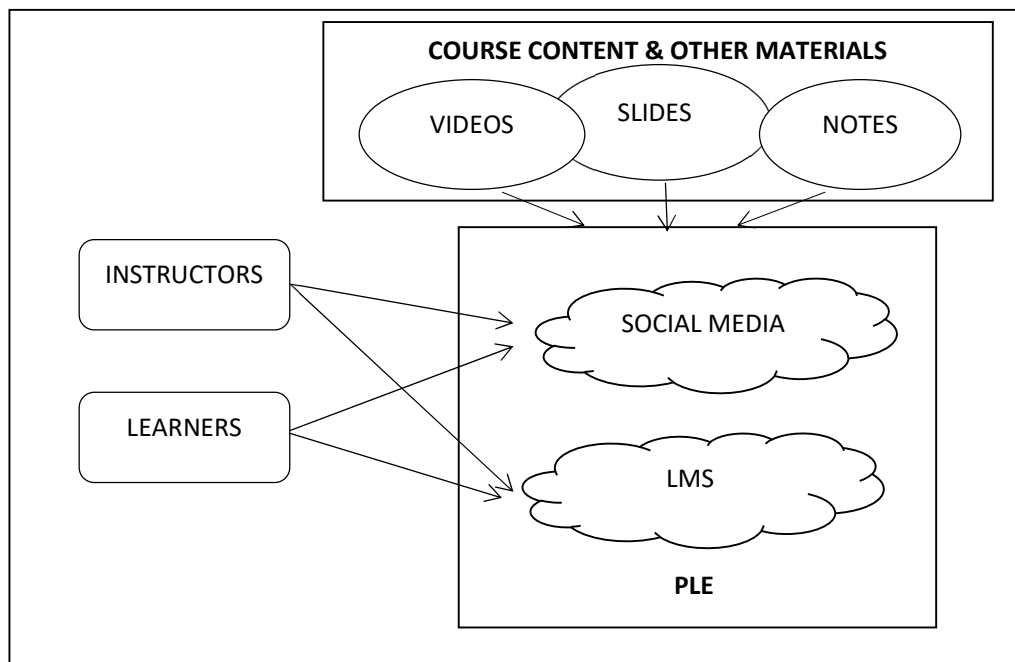

Figure 1 Social Network Teaching Pedagogy Model

This study proposes to accelerate the acceptance of social network to improve the personal learning environment.

Methodology

The Likert-scale type format was applied to the questions in the questionnaire. The questionnaire also included open-ended questions for eliciting the respondents' comments. The article uses the data collected from the pilot study for a preliminary analysis in order to refine the questionnaire to be used in a full-scale study later. This pilot study was carried-out by via questionnaires in a Malaysian private university. The pilot study is to ascertain about the preference of PLE, namely LMS, YouTube and Facebook among the students taking a statistics course. Data collected include the duration of the social network use, and whether the respondents like to use the LMS together with the other social media platforms in their personal learning environment. The data collected was processed and analysed using SPSS.

Findings

The instrument's internal consistency, Cronbach's alpha is 0.857. Refer to Table 1 for the constructs' Cronbach's Alpha.

Table 1 Cronbach's Alpha of the Constructs.

Item	Cronbach's Alpha
MT1	0.853
MT2	0.857
MT3	0.851
MT4	0.848
MT5	0.836
SP1	0.853
SP2	0.848
SP3	0.844

Item	Cronbach's Alpha
SP4	0.855
SP5	0.842
ST1	0.845
ST2	0.845
ST3	0.848
ST4	0.853
ST5	0.848

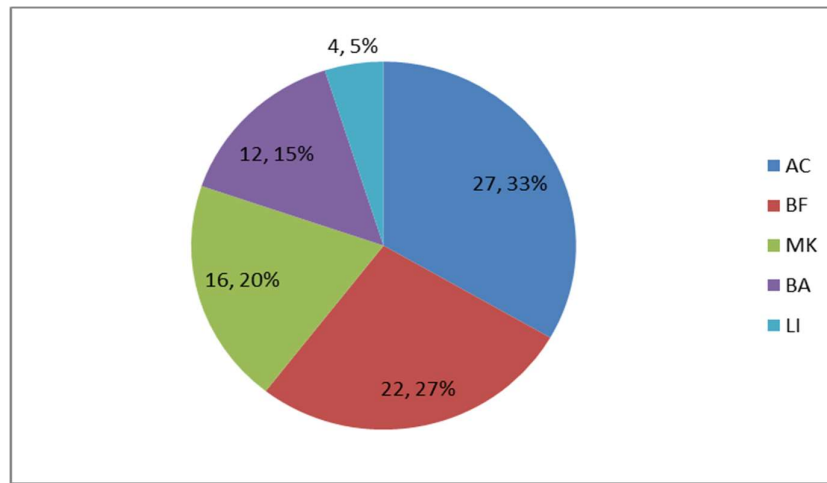Among the 81 respondents, 33% of them are from the accountancy programme.

Figure 2 Comparison of the percentage for Demographic Factors.
Note: AC=Accountancy, BA=Business & Administration, BF= Banking & Finance, LI=Logistics, MK=Marketing.

The respondents comprise of 42% Male and 58% Female, meaning that the respondents were quite evenly distributed between male and female. 51 respondents (63%) fall in the 19 to 20 age group and 37% of the respondents fall in the 21 to 25 age group.

Internet, Social Networks, and Online Platform Usage

On Internet surfing hours per day, 66.7% of the respondents spent more than three hours, 29.6% of the respondents spent '2-3 hours and 3.7% of the respondents spent less than an hour.

Table 2 Distribution of sample according to the daily amount of time for internet usage.

Daily Internet Usage	Freq.	%
< 1 Hour	3	3.7
2–3 Hours	24	29.6
> 3 Hours	54	66.7

75.3% of the respondents are fond of using the internet for services for social networks, 19.8% on entertainment and only 4.9% on education.

Table 3 Distribution of sample according to the type of usage of Internet services.

Internet Services	Freq.	%
Social Networks	61	75.3
Education	4	4.9
Entertainment	16	19.8

The participation level is the daily hours spent on the social network, where 46.9% of the respondents occupying two to three hours daily while 38.3% of the respondents occupying over three hours daily. Twelve respondents (14.8%) selected the 'less than one hour' category. Therefore, the participation of learners in the social media is considered eminent.

Table 4 Distribution of participation level according to the amount of time on Social Network Usage

Social Network Usage	Freq.	%
< 1 Hour	12	14.8
2–3 Hours	38	46.9
> 3 Hours	31	38.3

With regard to the PLE, 76.5% of the respondents think that it is a good idea and they like it. Furthermore, most respondents spend more than three hours on social networks for personal learning.

Perception of Social Media for Personal Learning

A five-point Likert scale measurement was adapted in the survey questionnaire. The result shows that spending longer time in the social network sites is correlated with intense intrinsic motivation.

Table 5 Respondents' Perception on Intrinsic Motivation for Learning by Using Social Media

Items	Mean	Std. Deviation	Spearman's rho Correlation Coefficient
MT1 (Self-learning statistics is very interesting and useful)	2.57	.611	.093
MT2 (It is more interesting to use the social media rather than the traditional learning in the classroom)	2.38	.799	-.343**
MT3 (I feel that I can learn statistics easily and more quickly in the Personal Learning Environment (PLE)	2.86	.685	-.075
MT4 (Using the social media to learn statistics will increase the flexibility to learn outside the classroom)	2.32	.722	.100
MT5 (Using social media to learn statistics will make the education process easier and more enjoyable)	2.19	.709	.029

The result also shows that most of the respondents selected SP2 (A variety of resources available on social media were helpful for my personal learning) on their perceived available support from social media resources.

Table 6 Respondents' Perception on the Support Available on Social Media

Items	Mean	Std. Deviation	Spearman's rho Correlation Coefficient
SP1 (Social media served as a backup will enable me to revise the lesson in future)	2.11	.689	0.089
SP2 (A variety of resources available on social media were helpful for my personal learning)	1.98	.591	0.033
SP3 (The social media was a useful means of contacting peer members and facilitators)	2.12	.696	-0.073
SP4 (The social media enabled me to ask questions that I normally find difficult to ask in classes/lectures)	2.43	.706	-0.035
SP5 (The social media helped me to communicate with other learners who are doing the same module)	2.32	.772	-0.023

Refer to Table 7 for Spearman's rank order correlation analysis results. The spearman correlations in this study were weak. It was observed ST4 and ST5 have positive correlations while ST1, ST2 and ST3 have negative correlations with satisfaction of the social media, which construct a foundation for the social media strategy.

Table 7 Respondents' Perception on the Satisfaction of the Social Media

Items	Mean (M)	Std. Deviation (S.D.)	Spearman's rho Correlation Coefficient
ST1 (Through discussions in the social media, my statistical related problems can be solved easily)	2.59	.648	-0.012
ST2 (Social media helped me to revise and learn at places and times convenient to me)	2.33	.689	-0.182
ST3 (While learning, I am also able to contribute my solution to my peers)	2.52	.573	-0.038
ST4 (I am happy to use the social media to learn statistics because I can learn something extraordinary)	2.33	.742	0.167
ST5 (PLE using the social media enabled me to study the statistics effectively)	2.63	.558	0.107

Variation in Intrinsic Motivation, Participation, Satisfaction and Supports

Analysis of variance proves significant correlation in MT2 where the respondents found it more interesting to use social media rather than traditional learning in classroom. The adoption of the collaborative social media enabled engagement and interactions and hence, interest in learning.

Table 8 Difference in the intrinsic motivation, support, satisfaction, and participation

Items	F	Sig.
MT1 (Self-learning statistics is very interesting and useful)	0.404	.669
MT2 (It is more interesting to use the social media rather than traditional learning in classroom)	4.674	.012
MT3 (I feel that I can learn statistics easily and more quickly in the Personal Learning Environment (PLE)	0.726	.487
MT4 (Using the social media to learn statistics will increase the flexibility to learn outside the classroom)	0.542	.584
MT5 (Using the social media as part of the teaching and learning statistics will make the education process easier and more enjoyable)	1.120	.331
SP1 (Social media served as a backup will enable me to revise the lesson in future)	0.570	.568
SP2 (A variety of resources are available on the social media and they were helpful for my personal learning studies)	0.484	.648
SP3 (The social media was a useful means of contacting peer members and facilitators)	0.577	.564
SP4 (The social media enabled me to ask questions that I normally find difficult to ask in classes/lectures)	1.045	.356
SP5 (The social media helped me to communicate with other learners who are doing the same module)	0.373	.690
ST1 (Through discussions in the social media, my statistical-related problems can be solved easily)	1.034	.360
ST2 (The social media helped me to revise and learn at places and times convenient to me)	1.951	.149
ST3 (While learning, I am also able to contribute my solution to my peers)	0.134	.875
ST4 (I am happy to use the social media to learn statistics because I can learn something extraordinary)	1.115	.333
ST5 (PLE using the social media enabled me to study statistics effectively)	0.187	.829

Findings from Open-Ended Questions

There were also open-ended questions to collect general comments. Most respondents positively perceive learning with social media as it is their choice of learning and a cost-effective solution, easier and useful as it includes information from databases, enables learning via animation, is interesting, accessible anywhere and flexible. The barriers are unfamiliarity to the social media platforms, untrustworthy sources and having tight schedule while some respondents still prefer to study on hardcopy or spend time on recreational activities. Respondents' comments on learning with the social media include:

> *"I surf the learning platform provided ex: Westlaw (database directory)"*
> *"It is convenient to bring everywhere"*
> *"To find extra information"*
> *"It is easy for me to understand the animated form"*
> *"Using it complete the assignment or homework that teachers give"*
> *"This makes learning more flexible and interesting"*
> *"Much easier and more interesting to self-learn"*
> *"Very useful"*
> *"Not familiar with these platforms"*
> *"Prefer studying on hardcopy, note and textbook"*
> *"Some of the sources cannot be trusted"*
> *"No time to use the online learning platform"*

Even though the students gave positive comments about PLE with social media, yet with some reservations. In other words, the respondents issued comments like the use of social media PLE is widely accepted and it makes learning easy, accessible, interesting, convenient and useful. Nevertheless, some respondents worry that they may be distracted, and others doubt the unfiltered information. These comments include:

> *"Very useful"*
> *"It is easily accessible"*
> *"Can easily get a lot of information and have a lot of examples online"*
> *"Easier to communicate and share information"*
> *"It is interesting"*
> *"A video with clear instructions can be used to learn statistics"*
> *"Convenient as most people have a Facebook account"*
> *"Some of my friends use it to do their research too"*
> *"A lot of knowledge although some is not filtered"*
> *"Sometimes I might get distracted"*

The advantage of using social media as the PLE is generally commented upon. In short, the respondents gave positive feedback about the effectiveness of personal learning via social media as the PLE enables learners to be flexible in studying anywhere, more so for a country with a high technology environment. On the other hand, some respondents also worry that they may be distracted from learning, and others doubt the accuracy of the information. The comments include:

> *"It is a great method to study effectively"*
> *"PLE using the social media is good because we can learn everywhere and it is flexible"*
> *"If I was born in the more high-tech usage country or environment, I will be able to adopt the PLE more easily"*
> *"Sometimes we do not know whether the information is correct or not"*
> *"For dependent students, they may lose their direction of the learning"*

Discussion and Conclusion

In terms of intrinsic motivation, one significant factor is MT2 of which the nature of social media provides more interesting learning. The results support the hypothesis of the positive impacts of intrinsic motivation in social network participation in learning. Findings show that most learners use the Internet - social media and other social networking sites but it still needs further improvement to cater for learning (Bozkurt, Karadeniz & Kocdar, 2017; Dabbagh & Fake, 2017). As highlighted by Du et al. (2018), effective online collaboration needs trust. This may be due

to the online content that lacks its appeal for learning purposes due to the large amount of unfiltered information that is available.

It is suggested that there should be acceptance of social media as a source of learning in the LMS. However, some learners still tend to be conventional in their approach where they prefer blended learning. On the supply side, many teachers who are using social media for teaching are early adopters (Hashim et al., 2015). It implies that there is an upward trend of the usage of social media in learning, and at the same time there is still a demand for the conventional offline approach where a blended learning approach is still a better option. The findings of this study have enhanced our understanding of the participation of the students in social network platforms as a preferred PLE. In short, it is found that the use of more time on participation in the social network correlates with the attainment of a stronger intrinsic motivation consistent with what was observed by Wang et al. (2012) as well as to develop students' satisfaction (Karunasena, 2015), particularly in terms of higher-level information and decision-making needs (Ahern, Feller & Nagle, 2016).

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