

Potential of Edmodo – an Educational Social Network Sites (ESNS) in Biology Classroom

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Abstract

Biological knowledge is placing its importance in advance among the sciences nowadays. Hence, as new technological devices along with its new trend in information technologies, the educators' responsibilities have changed vastly as to ensure that they are dated in the content matter, method and technological devices. This study investigates the impact of Educational Social Network Sites (ESNS) via Edmodo in promoting active engagement integrated subject matter learning and evaluating the challenges in using Edmodo in Biology and the identification of ideas generated based on using Edmodo in Biology. It was conducted at a public university in Perak district at Malaysia. The participants were 74 Diploma students who were registered in Biology code; all was taken for the analysis as they fall under the Edmodo users. Students were exposed to the traditional class and Edmodo for thirteen weeks. A research designed survey with a 5-point Likert scales ranging from strongly agree to strongly disagree and an open-ended question was administered. The findings of this work through the analysis showed that integrating Edmodo promotes active engagement and it was supported by appropriate subject matter learning. They were reported to rate perceived ease of use and agreed on statement of Edmodo was easy to handle, user friendly and manageable site. In addition, 6 distinct themes were found on the ideas of using Edmodo for Biology. These include Easy to use, Motivation, Create awareness, Materials availability, Improvisation of resource tools and Improve facility. Although there were some challenges reported in the integration of Edmodo, it apparent to have significant potential benefits for generating more positive effects towards learning Biology.

Keywords: Edmodo, Biology, Active Engagement, Subject Matter Learning, Challenge

1.0 Introduction

Three remarkable changes in this new century are smart devices are well accepted in all levels of community, the requirement of both collaboration and cooperation and the significant of economy by data analysis (Kim et al., 2014). Therefore education has been challenged to adapt with the current trend in context of smart learning requiring new education paradigm where student-driven learning is more important so that students have creative problem solving capability. For this reason, biologists are realizing that their responsibilities have changed, as the Internet has become one of the primary communication and resources including education system which redefining biology. The number of Internet users worldwide in June 2017 has

increased to 3.88 billion people where 49.7% were from Asia (Internet World Stats Usage and Population Statistics, Internet Users in the World, 2017). This shows that 50.1% of the world population are Internet users and have increased eight-fold since 2000. In other words, the biology educators have to ensure that they are current in the content matter, method and technological devices, in developing creative and innovative capacities, which in turn contribute to the enhancement of students' ability to collaborate in this global society. According to Leask (2004), collaborative communications using particular Web-based technologies have been used to support students' learning in higher education with the pedagogical objectives for global learning and teaching. Web 2.0 tools, such as blogs, instant messaging (IM), social networking such as Facebook, Twitter and Instagram have unlimited potential for global learning. Edmodo is one of variety of learning platform providing a simple way in constructing, managing and connecting an online classroom community both for educators and students. This exploratory study investigates the impact of Educational Social Networking Sites (ESNS) in promoting active engagement and subject matter learning, evaluating the challenges and ideas generated of ESNS usage in Biology among Diploma students of UiTM Perak Branch, Tapah Campus. The main research questions are: (1) Does active engagement can be generated based on the use of ESNS? And (2) how do university students' ideas and perceptions of social network sites (SNSs) on education for Biology perspective? The implementation of this study was on the university's course on Cell Biology, taught in the first years of the Diploma of Sciences at the University Teknologi MARA Perak Branch, Tapah Campus. The changing nature of the subject from conventional chalk-and-talk to the use of SNSs demands the students to maintain some expertise relating advanced technical knowledge along with their analytical thinking and communication skills active. In order to achieve the combined development of contents and skills, the use of SNSs promotes social interaction and a higher exposure to Biology environment.

2.0 Literature Review

Social Networking Sites (SNSs) with education

Social networking sites (SNSs) are popular for the past 10 years as a type of social software as they provide the combined usage of many Web 2.0 technologies into platforms that work as virtual gathering places for social interactions (Arquero and Romero-Frías, 2013). According to Marketing Magazine (2012), it was reported that Twitter has exceeded 500 million users while that number was 300 million on 2011 (Bennett, 2011). Meanwhile, Facebook had approximately have 1.9 billion users as of June 2017 (Internet World Stats Usage and Population Statistics, Facebook Users in the World, 2017). This remarkable increment makes it almost insensible to present statistics on the use of SNSs. Majority of the countries showed that the popular SNSs lead by Facebook followed by Twitter and LinkedIn (Sarah, 2011). SNSs seem to fill the lack of face-to-face interaction in some contexts of today's modern society. It can be seen clearly that how students might engage in SNS activity while studying (i.e., multitask) as considerable amount of time spent to SNS globally especially by the students. Though numbers of educators had accepted the fact that the potential benefits of social networking to assist the students involvements with their studies, some might say that such applications will concede

and disturb students engagement with traditional delivery of education (Selwyn, 2009). It has been supported by Hourdequin (2014) where SNSs aimed is not for education and they do not provide structures or useful tools which can support online educational environments. Therefore, Edmodo, Ning and Elgg that belongs to the Educational Social Networking Sites (ESNSs) have been formed.

Edmodo

Jeff O' Hara and Nick Borg designed Edmodo as a secure learning platform and accessibility free in 2008 for all levels of communities in education specifically the teachers, students, parents, schools, and districts, and is available at www.edmodo.com (Kongchan, 2013). It is similar to Facebook with the concern of privacy and safe because it allows only teachers to both create and manage accounts for their students, where they will obtain a group code to register in the group, access and join the group (Maryam, 2016). Edmodo offers a straightforward way for teachers and students in a virtual class to connect and collaborate. They believed that a social networking geared towards the needs of students could have an insightful impression on how students collaborate and learn in their world, rather than the school setting their teachers grew up in (Gushiken, 2013). Positive impacts have been associated with the use of Edmodo by strengthening the students-teachers relationship and also resulted in a convincing classroom community (Mills and Chandra, 2011). In addition, students can perform many virtual-classroom activities such as content sharing among the peers, submitting any given task for example homework, assignments and quizzes, receiving important notes as well as polls voting (Maryam, 2016). Research by Al-Said (2015) showed that students' have positive perceptions of Edmodo and Mobile learning is in "High" level in general since they think that learning using Edmodo facilitates and increases effectiveness communication of learning, and claimed to be time-saving application. In addition, the tasks given in Edmodo ignite the students' enthusiastic and motivation with the new teaching-learning technique (Deshpande, 2016). Likewise, ease-of-getting the resources was the main element that the students' preference of using Edmodo along with the support and communication such as forum, discussions and also for enjoyable online activities.

3.0 Methodology

Sample Population and Sample Size

This is a cross-sectional study conducted over a period of six months in second semester year of 2016 to 2017, among Diploma of Sciences students at Universiti Teknologi MARA, Perak Branch, Tapah Campus. The participants are the freshman year students who were enrolled in Biology code during semester one. This code provides an introductory concepts, processes and principles in cytology, biological chemistry and tissues. Stratified sampling was done and the participants consisted of 11 male students (14.86%) and 63 female students (85.14%). All participants were at the age ranged from 18 to 19 years old (100%) and they had little experiences in learning Biology through social networking in general.

Application and Procedure

Participants were exposed to the syllabus content and prepared learning modules through traditional classroom for 2 consecutive weeks during early semester. This module intended to give an exposure to the participants regarding the course outline and elements that will be integrated in the syllabi.

Preparation of Edmodo: An Educational Social Network Environment

Participants were assigned to register in Edmodo class and create a complete profile using their personal devices such as mobile phone or personal notebook. A specific group code was given to the participants in order to automatically join the Edmodo class. All learning resources such as course content, notes and related materials were shared through Edmodo resource's tool. Some of the tools included were *Note*, *Assignment*, *Quiz*, *Poll* and *Messaging*. Any lecture notes, audio notes, internet links, YouTube videos, website information or announcements were uploaded using *Note* tool. *Assignment* tool was used as homework or post-lecture discussion. Special warnings were given to the participants using *Alert* tool as a reminder of assignment's deadline. *Quiz* tool was used as pilot test or as reinforcement topics during lesson and participants were able to test the level of their understanding in each topic. Evaluation process or real-time discussion was conducted during or after traditional class using *Poll* tool.

Implementation of Edmodo

Edmodo was used as a supplementary tool to the traditional Biology classrooms and it was implemented during the third week of semester. Traditional face-to-face Biology classes were blended with Edmodo and it was applied at any time across the twelve weeks of semester. Participants were asked to prepare themselves for each lesson assisted by the Edmodo before attended to the traditional classroom. The three strategies of preparation were; 1) participants retrieved the information concerning lesson content using the Edmodo's resource tool before each upcoming traditional classes through mobile phone or personal netbook computer, 2) participants were assigned to read the notes before traditional classes, 3) participants were encouraged to post comments, discussion or argument related to the lesson contents. They were required to complete all of the given assignments, group discussion or quizzes and counted as their written assessments after attending traditional face-to-face classroom. In addition, they were encouraged to use *Chat* tool as a medium to interact with others in real-time and contribute to the peers by sharing any relevant notes, different links, pictures, mind mapping, exchange ideas and comments to the Edmodo resource tools to facilitate each other throughout the semester.

Research Instruments

A questionnaire with a five-point scale was administered in this study. The questionnaire was design in dual language (Malay and English) to assist in understanding of question items by the participants. Pre-survey questionnaires were given to the selected participants to enhance the validity of each question items. The question items included 4 sections:

a) 5 items for personal information.

- b) 10 items to infer the impact of social network platform based on the education to the participants; promote active engagement and subject matter learning.
- c) 6 items for the challenges using social network based on education.
- d) Open ended question to infer general ideas of using social network based on education for Biology.

All items in questionnaire had to be rated on a 5-point Likert scale ranging from “strongly disagree (1)” to “strongly agree (5)” except for demographic information and open ended question. This scale was used as scoring responses by participants for quantitative data analysis.

Data analysis

Data collection was done at the end of semester. Data entry and statistical analysis of question items was conducted using Statistical Package for Social Sciences (SPSS) version 21.0 (SPSS Inc. Chicago, USA). A reliability of the scales for question items was assessed by Cronbach’s coefficient alpha test to evaluate the question items consistency or stability. A value of Cronbach’s coefficient alpha (Cronbach α) more than 0.70 was considered high internal reliability (Santos, 1999). A simple descriptive statistics was used to analyze the data.

4.0 Results

Demographic data and the three areas of interest on Edmodo were embedded in questionnaire to acquire some basic information from 74 participants. The data were analyzed by simple descriptive statistic; frequency and percentage. 62.16% used mobile phone, 32.43% were using personal notebook computer and 5.41% for personal desktop computer to access social network. 33 participants were the active users of social network and had more than 4 years experiences using it, 35.16% of them had experiences 3 to 4 years and 14.86% rated their experiences less than 2 years. In regards to the Edmodo as one of the social networks and web 2.0 tools, only 45 participants (60.8%) were notified this tool during secondary school.

The participants’ opinions were considered in order to understand the impact of ESNs in promoting active engagement, the quality of subject matter learning to the participants and the challenges faced throughout the use of Edmodo. The questionnaire consisted several items was used as instrument. **Table 1** represents the reliability analysis measured by Cronbach’s Alfa. Items consistencies of all sections were scored greater than 0.70 as recommended and indicate the instrument achieved a good level of uniformity.

Table 1. Reliability analyses	
Sections	Cronbach’s Alfa scores
Promote Active Engagement	0.855
Subject Matter Learning	0.837
Challenge	0.783

Active engagement during class by means of they able to learn on their own or actively participated during classroom are two most important factors to enhance lifelong learning. **Table 2** depicts the analysis on the promoting participants' active engagement in the classroom facilitated by Edmodo. Majority of them agreed that they had better engagement during the class. 48.60% of them stated they were more engaged in Biology with help of Edmodo and they were motivated to succeed in Biology as they used Edmodo for Biology. 47.30% agreed that they become a self-directed individual as they used Edmodo for learning Biology. As they used Edmodo, they felt that they become more excited in learning Biology (45.90%) and actively participated to complete new tasks (41.90%).

Table 2. Promote Active Engagement

Dimension of Active Engagement	Mean	(n)Percentage%					Interpretation
		SD	D	SA	A	SA	
• I am more engaged in Biology with the help of Edmodo	3.66	(3)4.1 0	(3)4.1 0	(21)28.4 0	(36)48.6 0	(11)14.9 0	Agree
• I feel more excited in learning Biology as I used Edmodo	3.66	(1)1.4 0	(5)6.8 0	(23)31.1 0	(34)45.9 0	(11)14.9 0	
• I am become a self-directed individual/independent as I used Edmodo for learning Biology	3.72	0	(2)2.7 0	(27)36.5 0	(35)47.3 0	(10)13.5 0	
• I am motivated to succeed when I used Edmodo for Biology	3.67	(2)2.7 0	(3)4.1 0	(22)29.7 0	(36)48.6 0	10(13.50)	
• Edmodo makes me more active in learning Biology to check new information and to complete turn in assignments	4.11	(1)1.4 0	(3)4.1 0	(11)14.9 0	(31)41.9 0	(28)37.8 0	

SD = strongly disagree; D = disagree; SA = somewhat agree; A = agree; SA = strongly agree

The opinion of participants in regards to the subject matter learning through Edmodo was agreed to strongly agreed (**Table 3**). More than half of participants strongly agreed that the submission of assignments or tutorials become easily finalized as they used Edmodo (54.10%). 52.70% participants agreed for the statement by resources inside Edmodo was helpful for learning Biology. 48.90% of them agreed that Edmodo was suitable for Biology, while 45.90%

agreed that blending Edmodo with traditional classroom enhanced their knowledge in Biology and also provides resources that turns them into effectively learn Biology.

Table 3. Subject Matter Learning

Dimension of Subject Matter Learning	Mean	(n)Percentage%					Interpretation
		SD	D	SA	A	SA	
• Edmodo and traditional classroom enhanced my knowledge in Biology	4.15	0	(3)4.1 0	(10)13.5 0	(34)45.9 0	(27)36.5 0	Agree to strongly agree
• Edmodo provides resources that effective for me to learn Biology	3.85	(1)1.4 0	(3)4.1 0	(19)25.7 0	(34)45.9 0	(17)23.0 0	
• Edmodo is easy to submit Biology assignments/tutorials	4.39	(1)1.4 0	(2)2.7 0	(4)5.40	(27)36.5 0	(40)54.1 0	
• Edmodo is suitable for Biology code	4.24	0	(2)2.7 0	(7)9.50	(36)48.6 0	29(39.20)	
• The resources in Edmodo are helpful for Biology	3.78	(1)1.4 0	(5)6.8 0	(16)21.6 0	(39)52.7 0	(13)17.6 0	

An analysis of challenges using Edmodo was also evaluated. **Table 4** shows that 55.40% participants agreed Edmodo system was convenient and efficient to use in learning Biology. 52.70% stated that they only need a little time to learn Edmodo and the Edmodo’s site was organized and easy to navigate. Another 45.90% agreed that using Edmodo for Biology was easy. Majority of them had a regular access to the internet each week for Biology code (35.10%) and had an appropriate device to access Edmodo (33.80%).

Table 4. Challenges using Edmodo

Dimension of Challenges using Edmodo	Mean	(n)Percentage%					Interpretation
		SD	D	SA	A	SA	
• Using Edmodo for Biology is easy for me	4.07	0	(1)1.40	(16)21.60	(34)45.90	(23)31.10	
• I do not need so much time to learn how to use Edmodo for Biology	4.07	(1)1.40	(2)2.70	(10)13.50	(39)52.70	(22)29.70	
• Edmodo site is organized and easy to navigate	4.20	(1)1.40	0	(8)10.80	(39)52.70	(26)35.10	Somewhat agree to Agree
• Edmodo system is fast and convenient for Biology	4.01	(1)1.40	(2)2.70	(11)14.90	(41)55.40	19(25.70)	
• I have regular access to a computer or laptop each week for Biology code	3.61	(2)2.70	(8)10.80	(25)33.80	(21)28.40	(18)24.30	
• I have regular access to the internet each week for Biology code	3.76	(1)1.40	(6)8.10	(22)29.70	(26)35.10	(19)25.70	

An open ended question was given to the participants with the objective to infer general ideas of using social network based on education for Biology. They were asked to share and express

their opinions, comments or suggestions as regards in utilization of Edmodo to enhance learning in Biology. The results of this qualitative data demonstrate 6 distinct themes (**Table 5**).

Table 5. General ideas of using Edmodo for Biology

Theme	Responses
<p>Ease of use</p>	Edmodo is easy to use and user friendly.
	It is easy for us to submit assignments because we just have to access it through our mobile phone. Most of students nowadays have their own mobile phones so I do not think it is a bad idea to introduce this application (Edmodo) to other students.
	The application is really great and convenient for students to access and submit assignments. The application is really helpful in my studying and can be easily used.
	Edmodo's system is user friendly and easy to access. Really help students to submit assignments.
	I think using Edmodo is very efficient and nature friendly since everything was submitted online. It also notifies students about assignments.
<p>Motivation</p>	Edmodo helps me in learning Biology efficiently and can be access at any time anywhere.
	Using Edmodo enables me to do exercises and watch helpful videos to make me understand about the topic in the Biology subject that I learn more.
	Edmodo enables me to improve my knowledge in Biology to a better level with the help of tutorials provided by the lecturer.
	Great application to increase knowledge.
	In my opinions, Edmodo is really fun to be used. Because I do not need so much time to answer or submit assignments given by lecturer. Edmodo offers me to know the correct answer from the quizzes. I hope that Edmodo will be continued when I am in the next semester.
	Edmodo helps me to get information about biology code and also to access and interacts with lecturers outside classroom easily.
	Edmodo is the best!
	Edmodo really helps me in preparation for the test. Lecturer gave so many quizzes for students to help us in test.
<p>Create awareness</p>	Before signing up as a student for future Edmodo users, it is best to ensure that the email is also registered to avoid any difficulties in accessing it again afterwards.
	It is also a great idea for parents to join using Edmodo to also know the progress of their children by signing up as a parent. They can be notified the things their children learn and know the deadline of the assigned to their children.
	My suggestion is to promote Edmodo to all students and provide a

	<p>sharing session about Edmodo to students, how to use Edmodo.</p> <p>Edmodo should be used widely as it helps to increase knowledge in Biology.</p> <p>Use Edmodo for other subjects so that students can understand better these other subjects.</p>
Materials availability	<p>Edmodo needs to prepare more on exciting quizzes.</p> <p>Put more videos about the process in Biology so the students can easily watch it and download.</p> <p>I like to answer objective question only. So if Edmodo can ask many objective questions, maybe I will do it frequently.</p> <p>Edmodo should be well organized to make it easier to access as it is a platform for me to become an independent learner in understanding Biology.</p> <p>More videos and tutor should be uploaded regularly.</p> <p>Add more additional features to make it more interesting and beautiful.</p> <p>Add some more application in Edmodo for example live chat so that students can ask lecturer and share knowledge with others in live.</p> <p>Quiz after every chapter so that students will get a good recap about the studies.</p> <p>It would be much convenient if Edmodo has the additional option to upload a note file or pdf file about biology by users. On that other users can access the note and it can be useful in learning biology.</p> <p>Put more games and interactive lessons.</p> <p>Please put extra notes and videos in Edmodo.</p> <p>Increase the number of students to discuss online. Having a plenty of video for references.</p>
Improvisation of resource tools	<p>Edmodo is useful and comprehensive software to be used as a learning tool. But since Edmodo in this early period centric on the lecturer, the Edmodo activity depends on the lecturer free time. It is better some sort of assistant either lecturer or UiTM staff handle the Edmodo activities.</p> <p>Offline library that we can download online and view it in offline mode.</p> <p>The videos that were uploaded by the user should be viewed without downloading.</p> <p>Edmodo should improve its capability on submitting assignments such as mind map.</p> <p>Edmodo should be the place where I can organize lecture notes for Biology.</p> <p>Edmodo should be more systematic.</p> <p>Makes Edmodo more colorful by changing the wallpaper or theme.</p>
Improve facility	<p>Edmodo should allow a backup email for users.</p> <p>Upgrade version of Edmodo so that more easy and faster to access for</p>

	Biology.
	Edmodo as a good site to learn with any subject but the system should be improved. Sometimes when I have new assignments assigned to me from my lecturer, no notifications would pop up even though I did get it at high loudness.
	Improve its system so that it can be more compatible with all devices. Sometimes t think that it is not fair a part of studnets can answer the tutorial and got the grading but several students had problem accessing it so they did not get the grades

5.0 Discussion

The fundamental intention of this work was to elucidate the impacts of integration web 2.0 tool through ESNS; Edmodo, as supplementary instrument in learning Biology. This work focused on the influence of Edmodo to generate student-centered learning technology-rich environment by promoting active engagement. A systematic evaluation was implemented during the work in order to determine the suitability of Edmodo as authentic teaching and learning strategy that should or should not be run by educators. The effects of Edmodo were delineated by perceiving the appropriateness of content learning rated by the participants. With the different opinions and suggestions made by participants by the utilization of ESNS in learning Biology, a diverse theme of ideas was elaborated.

On the statement relating to the students’ active engagement in traditional classroom supplemented by Edmodo, the participants agreed that they had better engagement in Biology (M = 3.66 to 4.11). The incorporation between traditional classroom lesson and virtual classroom by the use of Edmodo was significantly to be a potential effective element in generating actively engagement students in learning Biology. Students’ active engagement towards learning Biology might transform due to the some factors such as learning environment. The strongest predictors of engagement are students’ perception on supportive classroom atmosphere (Guenther & Miller, 2011). The introduction of Edmodo as a new technology to the students might change the traditional classroom scenario which will automatically influence their engagement. The data appears that freshman year Malaysia’s university students hold a positively active engagement in learning Biology after utilizing Edmodo. As the practice of social network sites increases year by year, educators might employ this tool to enhance students’ active engagement in both traditional and virtual classroom. The findings from this work revealed that they agreed on the statement of becoming a self-directed individual or independent as they implemented Edmodo for learning Biology. The results was in parallel to the research work conducted by Charoenwet & Chistensen (2016), indicating self-regulated learning behavior among student whose undertook Biodiversity course was significantly improved as they taking part in Edmodo. Similar to the findings of this study, social network and microblogging Twitter was found to have a significantly greater increment in engagement among 70 pre-health professional majors first year students compared to the control group (Junco et al., 2011). They also proposed that Twitter supported engagement

through 1) improved student-faculty interaction by providing appropriate communication site, 2) encouraged student-student cooperation through virtual study group's discussion, 3) the promotion of active learning via assignments, 4) provide an immediate return answer for any rising issues, 5) maximized the time of given task, 6) high expected communication on any works and 7) motivating inactive students by discussing diversity issues.

The impact of utilizing Edmodo in learning Biology in terms of subject matter learning, students' perception was also evaluated. Findings display a strong positive responses towards the Edmodo as a good and useful supplementary instrument in enhancing learning Biology ($M = 3.78$ to 4.39). The dimensions in subject matter learning concerning the usefulness of Edmodo's Resources such as reference materials including YouTube videos, audio notes, related internet links or figures were reflected as beneficial resources. This is an indicator through which all resources materials embedded in Edmodo facilitated better understanding on simple and complex concept and theory in Biology. The findings were supported by similar outcomes; students' preference of using Edmodo was predominantly use of Resources such as unlimited digital library, sharing folder option or study material (Balasubramanian et al., 2014). It was mainly due to the well-organized system provided in Edmodo's Resources that can be access in short time. The benefits of Edmodo's Resources to the users allow fostering group-knowledge discussion rather than individual discussion according to the theme of 'sharing ideas beyond the traditional classroom'.

The inter-relation between social network education-based and the teaching-learning process might have a variety of challenges for instance requirement of strong and stable network connection, a need on the preparation class to handling and practicing the new application or requirement an appropriate devices to access the site. In regards to this, the results show moderately positive responses of Edmodo usage due to the challenges faced during implementation ($M = 3.61$ to 4.07). The dimensions in challenges using Edmodo specified the students' perceived ease of use and the findings discovered the agreement that the Edmodo was easy to use, user friendly, manageable site, simple instruction to access and works can be done immediately. Referring to the demographic data, majority of the students were experienced more than 4 years using social network, thus they were at ease on handling the application. The findings of this study are in alignment with previous study as well, there was a statistically positive correlation between perceived ease of use of Facebook as learning site and intention to use by the users (Mazman & Usluel, 2010). Another dimension of challenges using Edmodo were whether 1) students have regular access to mobile phone, laptop or personal computer, 2) students have regular access to internet. The data shows a lower agreement on these statements. Based on demographic data, most of students were used mobile phone instead of personal computer or laptop to access Edmodo. It was confirmed that a small in size screen of mobile phone was found to be unsatisfied devices for users for surfing Edmodo (Al-Kathiri, 2014) and lower income students might influenced the use of Edmodo regularly.

More interesting section in this work was the responses that describe the opinions, comments, problems, satisfactions and suggestions of students that were collected from the open-ended question. In regards to the use of Edmodo as supplementary instrument in learning Biology, Edmodo was supported by several positive statements made from the participants. The

qualitative data was grouped into 6 distinct themes in order to observe their point of views. Some of the theme was highlighted from previous study (Usman & Oyefolahan, 2014) and addition of new theme as follows:

1. Ease of use: The responses depict that they were satisfied with the interface of Edmodo as it efficient, nature friendly and convenient way in submitting tasks.

2. Motivation: The responses describe that Edmodo increase their learning capabilities and self-esteem in Biology by watching related videos, quizzes and even easy to interact with other lecturers without barriers. This is the platform that enables them to commit better attention and enthusiasm in learning Biology.

3. Create awareness: The responses suggested that authority should formulate methods to promote Edmodo to all students and offer the use of Edmodo in other subjects. They believe that Edmodo could help them increase their knowledge with the implementation of Edmodo in each subject. Apart from that, it is recommended to provide a sharing session class on Edmodo interface and the tools and features that can be used by them to avoid miscellaneous problems during implementation.

4. Materials availability: The responses outlined the need for sufficient provision of learning materials for instance regularly uploaded objective quizzes, videos for extra references, games and interactive modules or content learning for continuity of revision lesson. They valued the availability of materials and the flexibility of provided learning materials, thus making and providing learning materials might support students' learning and increase their performances.

5. Improvisation of resource tool: The responses proposed that some of the resource tools need to be improved for example offline library that can be used without the requirement of internet and playing videos without downloading it.

6. Improve facility: The responses looking forward to the improvement some of the existing tools inside Edmodo as they believe Edmodo is a comprehensive application to be used by them in order to facilitate effective learning.

6. Conclusion

In relation to the objective of the study, it can be concluded that Diploma students at Universiti Teknologi Mara Perak Branch, Tapah Campus have positive perceptions towards Edmodo as they agreed that active engagement had occur while using it. While students gain extra informative knowledge provided by ESNS; Edmodo, students can benefits from both traditional classroom and Edmodo from the active engagement as it ensures that an open transparent-knowledge transfer was occurred and no longer restricted in places. This result was inferred that the role of ESNS should be considered as supplementary instrument for Biology educators to enhance teaching and learning environment.

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