SCHOOLOGY AS E-LEARNING MEDIA IN THE DIGITAL INNOVATION COURSE: STUDENTS' PERCEPTION

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Abstract

This study was conducted to investigate the level of perception of students in teacher education institute towards Schoology as a media in teaching and learning. The investigated constructs include usefulness, course content, suitability and user friendly. Seventy students majoring in Mathematics, History, English and Islamic Studies who had been using Schoology had participated in this study. This research is based on descriptive statistics using questionnaire to collect data. The data obtained was analyzed using the Statistical Packages for Social Science (SPSS) program which include distribution frequency, percentage, means and standard deviation. The finding indicated that the overall perception level of respondents towards the application of Schoology was high (*M* = 4.07, SD = 0.63). The mean scores for two constructs of perception were high as below: Ease of use (*M* = 4.25) and Usefulness (*M* 4.15). Two constructs such as Course Content (*M* = 3.88) and Intention Use (*M* = 3.99) were moderately high. Statistical analysis using ANOVA revealed that there were no significant differences in perception level according to subjects major. Hence, the use of Schoology as an e-learning medium is relevant and appropriate for all types of courses offered in the institution.

*Keyword*s: Schoology, perception, e-Learning, usefulness

Abstrak

Kajian ini bertujuan untuk meninjau tahap persepsi pelajar institut pendidikan guru terhadap aplikasi Schoology sebagai satu media pengajaran dan pembelajaran dari segi kebergunaan, kandungan kursus, kesesuaian dan mesra guna. Seramai 70 orang pelajar pengkhususan Matematik, Sejarah, Bahasa Inggeris dan Pendidikan Islam Program Ijazah Sarjana Perguran (PISMP) yang telah mengguna Schoology terlibat sebagai responden dalam kajian ini. Kajian ini dijalankan secara deskriptif dengan menggunakan soal selidik. Data yang diperoleh telah dianalisis dengan menggunakan program *Statistical Package for Social Science* (SPSS) yang merangkumi taburan frekuensi, min dan sisihan piawai. Dapatan kajian mendapati bahawa tahap persepsi pelajar terhadap penggunaan aplikasi Schoology berada pada tahap tinggi (*M* = 4.07, SP = 0.63). Hasil kajian mendapati dua aspek persepsi berada pada tahap tinggi dengan min bagi setiap aspek seperti berikut: mesra guna (*M* = 4.25) dan kebergunaan (*M* 4.15)

manakala kandungan kursus (*M* = 3.88) and niat terus guna (*M* = 3.99) berada pada tahap sederhana tinggi. Melalui ujian ANOVA masing-masing menunjukkan bahawa tidak terdapat perbezaan min yang signifikan mengikut pengkhususan. Justeru, penggunaan Schoology sebagai media e-pembelajaran adalah berpotensi dan bersesuaian serta wajar dilaksanakan bagi semua jenis kursus yang ditawarkan di institusi.

Kata kunci: Schoology, persepsi, e-pembelajaran, kebergunaan

INTRODUCTION

The advancement of information technology has transformed teaching and learning method in educational institutions. Previously, the learning process was only carried out in the classroom. But now, it can be implemented everywhere, anytime and any place, without restrictions of time and boundaries. This learning approach is called electronic learning that benefits many students as it saves time, places and providing fun for the students. Using this approach, students can interact with their peer students and lecturers, getting feedback or response quickly from their peers and lecturers (Waheed & Hussain, 2010). With variety of digital technology tools and media such as Schoology, Edmodo, Quizzes, Padlets, BlendSpace, allowing electronic learning to be implemented easily. Indirectly, it creates a conducive e-learning environment to develop interest and passion for students by engaging actively (Saiful Afzan Baru, Lazim Abdullah, Azwadi Ali & Hafiz Yusoff, 2014). Hence, it is important for educational institutions to utilize digital technology tools in their teaching and learning methods, as it brings benefits to students and lecturers. Those institutions which are not utilizing technological resource will be left behind in the era of globalization (Waheed and Hussain, 2010).

The existence of new digital tools such as Schoology, Edmodo, Padlet and others have made information accessible at any time, anywhere and at any place (Aliff Nawi & Mohd Isa Hamzah, 2013). These had encouraged lecturers and students to explore more attractive teaching and learning materials for their teaching purposes. With digital tools such as Schoology, e-learning can be accessed anywhere and anytime, depend on the user's time, capabilities and network connectivity.

Schoology is a learning management system (LMS) allowing users to create, manage, and share content and resources. It is also known as a course management system (CMS) or virtual learning environment (VLE), the cloud-based platform that provides tools to manage any classroom or blended learning environment. It is design to support teaching and learning methods which allows teaching and learning to be carried out without restriction of time and place, as long as the environment has an network connectivity. In other words, Schoology allows lecturers and students to interact and communicate with each other via online and share information, downloading learning resources and uploading assignments. This will help students to improve their productivity in terms of communication, collaboration, critical thinking, creativity, knowledge in finding information, and using computer and internet skills. Hence, research on the use of Schoology should be carried out especially in terms of Schoology's perception among students. The researcher will study the perception of the students towards Schoology application in conducting the Digital Innovation Course.

The Digital Innovation Course is a compulsory elective subject for all students of the teacher education institute. This course is introduced in 2018. The course provides opportunities for students to explain the concepts and the processes of innovation, generate ideas in developing innovation project, preparing, developing and implementing innovation project for teaching and

learning; promote, market and evaluate innovation project. In implementing the course, Schoology is used as an e-learning medium between students, peers and lecturers in order to complete the course in digital form. The implementation of the Digital Innovation Course is still new and it requires various research to ensure that the goals of the course are achieve successfully.

PROBLEM STATEMENT

Previous studies state that LMS could bring positive effects and benefits to the students in their learning. The characteristics and features of Schoology such as perceived usefulness, course content, suitability and ease of use allowing lecturers and students discussing the topics in Digital Innovation Course freely without restriction of boundaries. Students, friends and lecturers are able to communicate and interact anywhere such as in libraries, cafeterias, hostels and others. Karyawati and Ndadari, (2016) state that Schoology gives opportunity to passive students to deliver their opinions through online learning. They admit that Schoology can create new atmospheres in the classroom. Besides, students can create their own group discussion through Schoology and helped them in learning the Digital Innovation Course.

Sharma and Vatta (2013) admit that LMS can increase motivation of learners, promote learning, encourage interaction, provide feedback and support can be provided during the learning process, supports content in various formats, for example, multimedia, video, audio and text. The course content is updated and students can see the changes made in the particular field (Sharma and Vatta, 2013). On the other hand, Sharma and Vatta (2013) explain that there should be more investigations needed in different aspects such as extra modules for identifying the best content among the similar subjects and checking quality of the content. They state that Schoology application tend to be course centered rather than student centered.

Therefore, it is important to be carried out this study and needed to ask for students feedback and perceptions using Schoology in the Digital Innovation Course because their perceptions might affect their way of thinking and attitude in handling activities and assignments. Although, Schoology is ease of use and perceived usefulness to students, but this depends on their willingness to participate in activities. Hence, the focus of this study is to investigate the level of perception of students in teacher education institute towards Schoology as a tool in teaching and learning.

RESEARCH OBJECTIVES

Generally, this study aimed to examine the perception of students who are using the Schoology application as a teaching and learning medium in implementing the Digital Innovation Course. Specifically, this study aims to answer the following questions:

1. What is the level of students' perception in term of ease of use, usefulness, course content and intention use of Schoology application?
2. Is there a significant difference in students' perception based on course programs?

LITERATURE REVIEW

Online or electronic learning has brought positive impact in education, particularly in teaching and learning methods. Teaching and learning can be carried out through online with the help of interactive media and technology such as Schoology, Edmodo, Padlet, BlendSpace and Quizzes such as Kahoot, Quizzes and Plickers. The existence of these tools has changed the traditional teaching and learning method to electronic learning or e-learning. Waheed and Hussain (2010) admit that this approach is very useful to students as it helps students to save time and money.

E-learning has created a conducive, more engaging and fun teaching and learning environment. It has changed students' learning and teachers' teaching methods. According to Waheed dan Hussain (2010) e-learning is a methodology using any electronic media either intranet or hyper media documents. Canole *et al.,* (2008) defined e-learning as the use of any kind of internet service, communication and electronic devices that support learning activities. Hence, using Schoology application will help in enhancing students learning experiences and improving learning outcomes and abilities.

Schoology is a classroom-based Web 2.0 that helps students and lecturers interact even outside the classroom. Learning materials become more interactive and creative (Harlina Ishak, Zubaidah Mat Nor & Ainee Ahmad, 2017) and can be downloaded at any time base on the students' free time. Hence, e-learning makes learning simpler, easier and more effective. With e-learning, students can access the course content in unlimited number of times, flexible in time and place, provide quick delivery of lessons, providing lifelong learning, cost effectiveness and paperless way of learning (Song, 2010). These benefits can affects the students's attitude and perception towards Schoology.

In other words, e-learning environment facilitates student-centered learning and helps creating a collaborative learning environment that encourage students to participate actively in the learning process. Students are able to determine their own learning phases and thus can significantly improve learning outcomes and abilities. This study discusses the Schoology application as a medium that supports lecturers' teaching methods and students' learning outside the classroom. This medium is used by lecturers in implementating the Digital Innovation Course.

The Digital Innovation Course is introduced in early 2018 for Semester Six students. Discussions on this course were carried out among students, peers and lecturers. Lecturers can communicate with students through Schoology application without restricton of time and place. Additionally, this application can be installed on mobile, making it easier for students to use it after class. This means that Schoology application is flexible and appropriate system to help the Digital Innovation Course to be carried out effectively. Flexible systems with enough content and quality information will meet the needs and satisfaction of the students. However, learning environments should have network connectivity to enable students to access resources easily and quickly (Agatha Francis & Muhamad Suhaimi Taat, 2016).

Previous studies have discussed the effects and use of interactive media, particularly in the context of open and distance education. Dias Febryastuti Susanto (2016) had conducted a study on the Use of Blended Learning Methods with Media Schoology. It is found that the effect of the Blended Learning method with the Schoology as a media had improved the student's Self Regulated Learning by 58.33%. According to Dias Febryastuti Susanto (2016), the improvement can be seen in the final test results. Students' understanding also increased when using Schoolog.

In a study by Roshayati Abdul Hamid, Noor Hasni Juhdi, Norazila Mat and Roshidah Abdul Wahab (2015) proved that students' achievement had improved after using XTech software.

Students also have positive perceptions on constructs such as usability, ease of use and intention to use the software in the future (Roshayati Abdul Hamid, et al., 2015). Harlina Ishak, Zubaidah Mat Nor and Ainee Ahmad (2017) had conducted and proved that Kahoot is an interactive learning for the 21st Century Teaching. The results showed that 73% of students agreed that Kahoot is a creative and interactive resources. The results also showed that 86.5% of students are able to recall their skills taught through Kahoot. This shows that technology tools and media such as Kahoot can support teachers' teaching methods.

Faizatul Hafilah Abdul Hamid and Nor Syahilia Aris (2016) had also perceived their study and found that most students had a positive perception on blended learning. They found that students accepted e-learning. In contrast, a study by Normilawati Hassan and Azliza Yusop (2009) showed that students' perceptions on e-learning system at Kuantan Community College were moderate (M = 3.52). They found that two constructs namely: usefulness and suitability affects students' perception moderately. This showed that the e-learning system in Kuantan Community College is used by students effectively but need improvement. Agatha Francis Umbit (2017) supported this study and found that constructs such as Schoology quality had given negative impact on the acceptance of the system.
In a study conducted by Ab. Hamid Ali, Fadzli Adam and Wong, Wan Solihin Abdullah (2014) explained that usefulness factor does not affect the acceptance of e-learning among users. This means that Schoology's quality and usefulness factor need to be reviewed. Based on the findings of the previous study, it can be concluded that interactive media and technology tools have a positive impact on teaching and learning methods. This suggests that interactive media and technology such as Schoology is suitable for lecturers' teaching method and students' learning media of today. Hence, it is important as various constructs can affect the failure and successful implementation of e-learning environment.

METHODOLOGY

Research Design

This study is conducted to examine the students' perception towards Schoology as a medium in implementing the Digital Innovation Course. The design of this study is fully quantitative, using questionnaire as an instrument to collect data. Meanwhile, the 70 research respondents (21 males, 49 females) were from four different groups such as Mathemathic, English, History and Islamic Education. The respondents were selected using purposive sampling, a sampling technique with certain consideration. This is because the research was focused on respondents who are taking Digital Innovation Course in Teacher Education Institute in Sarawak.

Instrument

The questionnaires for this study was designed and modified from previous studies in e-learning, involving five sections: Part A consists of demographic information, Part B consists of ease of use, Part C consists of usefulness and suitability, Part D consists of course content and Part E consists of intention to use. The questionnaires consist of 21 items and measured by a Likert Scale ranging from 5 points "Strongly Disagree" to "Strongly Agree". All of these sections are divided into four constructs that include ease of use (5 items), usefulness and suitability (6 items), course content (7 items) and intention to use (3 items). These questionnaires were used by other researchers in their study such as Davis, Bagozzi and Warshaw (1989), Davis (1989), Normilawati Hassan and Azliza Yusop (2009), and Fauziah Ahmad Muhd Zailani and Jamaludin Badusah (2010).

The data were analyzed using the Statistical Packages for the Social Science (SPSS) version 20.0 and presented in the form of frequency, percentage, mean and standard deviation. Cronbach's alpha statistic is applied to measure the internal consistency of each item under the four constructs. Table 1 reveals the Cronbach's alpha reliability of independent and dependent variables, namely ease of use (0.93) consists of 5 items, usefulness and suitability (0.89) consists of 6 items, course content (0.89) consists of 7 items and intention to use (0.89) consists of 3 items. The Cronbach's alpha reliability coefficient for the present sample (N=70) is 0.90, indicating that the instrument has highly reliability.

Table 1

The reliability coefficient of 'Cronbach Alpha' for the instrument of study (N=70)

No.	Item	Cronbach Alpha Value	Number of Items
1.	User Friendly	0.93	5
2.	Usefulness and Suitability	0.89	6
3.	Course Content	0.89	7
4.	Intentation to Use	0.89	3

Data Analysis

Items in Part A were analyzed based on frequency and percentage. Items in Part B, C, D and E were analyzed based on inferential statistic using one-way Anova. Using one-way Anova is to determine whether there is difference in the level of perception based on group and programs of the respondents. The level of perception was divided into 4 categories, namely low, medium low, medium high and high as shown in Table 2 to determine the level of perceptions shown by respondents.

Table 2

Level of Perception (Nunnally, 1994)

Category	Mean
Low	1.00 – 2.00
Medium Low	2.01 – 3.00
Medium High	3.01 – 4.00
High	4.01 – 5.00

FINDINGS AND DISCUSSION

A total of 70 respondents participated in this study. Out of 70 respondents, 49 (70 %) were females and 21 (30%) were males. This shows that the number of female respondents are higher than the number of male respondents as shown in Table 3. About 84.3% (59) were between 21 to 22, 15.7% (11) respondents age between 23 to 25 and none of the students ages between 19 and 20.

Table 3

Demographic Information

Variable	Category	Frequency (F)	Percentage (%)
Gender	Male	21	30
	Female	49	70
Age	19 -20	0	0
	21 – 22	59	84.3
	23 - 25	11	15.7
Courses	Mathematics	30	42.9
	TESL	13	18.6
	History	14	20
	Islamic Studies	13	18.6
Location for Accessing Schoology	Institute	63	90
	Home	18	25.7
	Cyber	7	10
	Others	11	15.7
Number of Hours using Schoology in a day	Less than 1 Hour	25	35.7
	1 – 2 Hour	34	48.6
	2 – 3 Hour	10	14.3
	4 – 5 Hour	1	1.4
	More than 5 Hour	0	0

Respondents participated in this study were majoring in Mathematics that is 42.9 %, 20% majoring in History Studies, while 18.6% major in Teaching English Second Language (TESL) and Islamic Education. About 90% (63) had accessed Schoology at the institute, 25.7% (18) accessed Schoology at home, and 15.7% (11) had accessed Schoology in other places such as libraries and friends home, meanwhile 10% (7) had been accessing Schoology in Cyber . Based on the analysis of the study as shown in Table 3, it was found that the respondents did not use Schoology over 5 hours. Respondents who had been using Schoology between 1 to 2 hours a day showed the highest that is 48.6% (34), 35.7% (25) used Schoology less 1 hour a day, and 14.3% (10) used Schoology between 2 to 3 hours a day. Meanwhile,only 1.4% (1) had used Schoology within 4 to 5 hours.

Ease Of Use

Table 4 presents the overall mean values for each items of ease of use. All items for ease of use had mean values above 4, which indicate that students had high level of perception in term of ease of use (M = 4.25, SD = 0.71). However, there is no item with mean values above 4.50. The highest mean value of the students' perception was item 2 (M = 4.41, SD = 0.65) “Files can be dowloaded easily”. In contrast, “Links to the homepage and additional sites make it easier for me to operate the Schoology application” (M = 4.13) scored the lowest. This indicates that Schoology application is user friendly and easy for students to use.

Table 4

Perception on the Schoology Application based on Ease of Use

Item	Ease of Use	Mean	SD
1.	The Schoology application allows me to view content easily	4.26	0.74
2.	Files can be downloaded easily	4.41	0.65
3.	Assignments can be uploaded easily	4.24	0.75
4.	The navigation menu helps me to use the Schoology application with ease	4.19	0.75
5.	Links to the homepage and additional sites make it easier for me to operate the Schoology application	4.13	0.68
	Overall mean	4.25	0.71

Usefulness

In general, the results show that students had high levels of perception based on usefulness (M = 4.15, SD = 0.80) as shown in Table 5. All items for usefulness had mean values above 4 and except for item 11 "I easily access Schoology application at any place" which had the lowest mean values (M = 3.90, SD = 1.08). This shows that students can easily access information using Schoology wherever they are, anytime and at any place. The results also showed that the information obtained helps students to perform their tasks and other courses, as shown in Item 8, "The information provided can help in the courses" (M = 4.36, SD = 0.64) as shown in Table 5.

Table 5

Students' perception based on Usefulness

Item	Usefulness	Mean	SD
6.	The information provided in the Schoology is easy to understand.	4.20	0.65
7.	Information provided in the Schoology application is clear.	4.24	0.69
8.	The information provided can help me in the courses studied	4.36	0.64
9.	The Schoology application helps students to practice Self Learning Time	4.10	0.85
10.	Learning using the Schoology application saves time	4.07	0.89
11.	I easily accessed the Schoology application at any place	3.90	1.08
	Overall Mean	4.15	0.80

Course Content

The results of this study showed that the level of perception based on course content in using Schoology application in the Digital Innovation Course is medium high with a mean of 3.88 and standard deviation of 0.82. Analysis of the findings showed the overall mean for all items are “moderate” above 3 except for item 18 which is high at 4.03. Table 6 reveals the highest mean of students’ perception based on course content, in item 18 (M = 4.03, SD = 0.88). This showed that Item 18 "Interaction between pages is very interactive", had indicated that course content is highly interactive and links between pages or websites function well. However, Item 15, "The color in Schoology application is attractive" shows the lowest mean value (M = 3.73, SD = 0.96). Students admit that the color in Schoology display is less interesting. They also realized that the font size in the Schoology application was less attractive as shown in Item 14 (M = 3.76, SD = 0.92) as shown in Table 6.

Table 6

Students’ Perception towards Schoology based on Course Content

No.	Course Content	Mean	SD
12.	The icons in the Schoology application are very interactive	3.84	.79
13.	The graphical display of the Schoology application is appropriate	3.90	.78
14.	The font size in Schoology application looks attractive	3.76	.92
15.	The color in Schoology application is attractive	3.73	.96
16.	Links from page to the page, makes Schoology an interesting application	3.93	.71
17.	When clicked, most of the links provided to other sites can work well	3.96	.71
18.	Interaction between pages is highly interactive	4.03	.88
	Overall mean	3.88	0.82

Continue Intentation Use

Table 7, showed the overall mean value for continue intention use (M = 3.99, SD = 0.87), which indicated that the students had moderate high levels of perception towards Schoology in the

Digital Innovation Course. The highest mean value of continue intention use is shown in Item 19 (M = 4.06, SD = 0.76), which indicate that students have the intention to continue using Schoolgy application for their learning process. Apart from that, students accepted Schoology application positively based on the mean values obtained for items 20 and 21, indicating that students are willing to use Schoology more than other alternative applications in assisting them in the e-learning process. This shows that the Schoology is still consider as an interactive learning tool that can be used as a platfrom in conducting e-learning effectively.

Table 7

Students' Perception based on Continue Intention Use

No	Continue Intention Use	Mean	SD
19.	Schoology is an effective interactive learning tool.	4.06	.76
20.	I intent to continue use Schoology more than other applications.	3.87	.92
21.	If possible, I intent to continue use Schoology application.	4.03	.93
	Overall Mean	3.99	.87

By analyzing using one-way Anova, there is no significant difference between students' perception of Schoology and course programs. The overall results for level of perception among the four course programs showed the significant value is at p=.03, which is smaller than p = 0.05. As shown in Table 8, the results of ANOVA test showed the value for each element namely: ease of use (p = .39), usefulness (p = .01), course content (p = .18) and continue intention use (p = .01), this concludes that there is no significant difference for students' perceptions based on course programs. The results also show that the level of perceptions are almost similar among students in various program. This is because they received the same information in Schoology application. Apart from that, the sources given to them are based on the Course Curriculum.

Table 8

Results of One-way ANOVA Test between Course Programs and Perception

Variables	Chi Square Mean	F	Value *p*
Ease of use	.35	1.01	.39
Usefulness	.34	4.75	.01
Course Content	.47	1.67	.18
Intention to Use	.59	4.24	.01
Perception	.35	3.17	.03

Notes. *df (3, 66)* p > .05

CONCLUSION AND RECOMMENDATION

Based on the mean range, the overall mean values of students' perception towards Schoology was high (M = 4.07). Two constructs, such as ease of use and usefulness show a highly average mean score between 4.15 - 4.25, meanwhile the course content and intentation use show a moderate high mean score between 3.88 - 3.99 as shown in Table 9. The results of this study are moderate high significant. Four independent variables have been measured that is ease of use, usefulness, course content and continue intention use and the results show that these constructs are strongly affecting the dependent variable.

Table 9

Average Mean Score for each element of Students' Perception

Constructs	Mean	Level
Ease of Use	4.25	High
Usefulness	4.15	High
Course Content	3.88	Medium High
Continue Intentation Use	3.99	Medium High
Overall Mean	4.07	

The results of the study conclude that Schoology is an effective application as an e-learning media in implementating Digital Innovation Course. The results showed that students have a high level of perception towards Schoology application. However, the implementation of the Digital Innovation Course requires skills and knowledge in the usage of Schoology in conducting effective e-learning environment to achieve self-esteem among students. In other words, the application should contain attractive and informative course content, interesting features such as ease to use and usefulness. Course content should be adequate to accomodate students' needs because these features will encourage students in accepting and having the intention to continue using the application. In addition, the use of Schoology has a positive impact on students. Indirectly, it allows students to communicate with peers and lecturers, collaborate, by creative in conducting e-learning and develop critical thinking skills among students and their peers.

The implementation of electronic learning enviornment is in line with the demands of the 21st century education era. This is because the implementation of e-learning environment and usage of interactive tools are very useful for students and lecturers. The implementation of e-learning can provide many benefits to students. Students can learn more in e-learning environment without any restrictions of boundaries. Therefore, students must equip themselves with various constructs such as attitude and perception in ensuring that the e-learning can be implemented properly and effectively.

However, various constructs need to be reviewed and revised, as it can affect the perception of students towards Schoology. More user friendly course content need to be taken into consideration, as it will benefit students. Monitoring of the use of Schoology should be carried out periodically by the management to ensure it is being implemented more effectively. The management also can introduce other open source to allow students and lecturers to have their preferred choice in interactive tools or media for conducting their courses.

The outcome of this study provide recommendations to management and lecturers, so that they can monitor the usage of Schoology generally and developing the course content particularly. Management should take into consideration the constructs that have been pointed out in this study, before implementating e-learning. Other open sources software should be introduced to lecturers and students so that they have choices in interative tools. However, this study has limitations that should be addressed and taken into account in future research. It is necessary to carry out further research on a larger scale in terms of samples that involve some other cohorts to provide a more robust study outcome that can explain the effectiveness of the Schoology application in depth.

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