Investigation on Student Accessing Information for ICT- Learning Approaches

Haziana Abdul Halim *
Widad University College, Malaysia
Email: haziana@widad.edu.my

Ananthi Krishnasami,
Widad University College, Malaysia

Yanti Hidayu Aziz,
Widad University College, Malaysia

Noor Suhani Sulaiman
Widad University College, Malaysia

Adzhar Kamaluddin
University Malaysia Pahang, Malaysia

* Corresponding Author

Abstract
Purpose: The purpose of this study is to investigate the level of student's performance using the traditional approach and the integration of e-learning in teaching and learning process. Also to investigate the frequency of student's accessing the multimedia contents, forums, and quizzes using multimedia learning
Design/methodology/approach: The research approach were conducted through a questionnaire. The study sample consists of two groups of students: group A for traditional approach of learning and group B of e-learning approach. The subject tackled Instructional Design Technique and Authoring Tools with Moodle that are used as an e-learning platform. Instrument used in the research are questionnaires and log data from the activities in the Moodle. The results of questionnaires are analyzed using SPSS software.
Findings: Based on the analyzed data regarding students' perception of the traditional learning, 53% of the students disagree that this method helped them in improving the current understanding of learning. A total of 55% students express their agreement with the use of multimedia learning to increase student understanding. 70% students also agreed on the use of forum can help them in their learning process. The studies showed the improvement of student learning using multimedia to increase at the rate of over 55% students get A, 25% obtain B and 15% score C. The results have indicated that students have shown better learning performance using e-learning compared to traditional learning.
Research limitations/implications: Learning using multimedia methods requires the use of hardware, software and internet facilities. The main factor is that through the effective use of multimedia technology learning is to use the internet to facilitate students to access learning

materials everywhere and at any time. But not all students have this facility and cause students to have internet access constraints to get material learning from Moodle.

Practical implications: Through the use of multimedia teaching learning can provide a variety of learning materials in a more interactive format. Preparation of notes in a visual format, power-point, video, and animation to attract students and help students easily understand the learning content. Multimedia learning also improves student performance based on the student accessing. The frequency of student accessing showed that the student likes and enjoyable using multimedia learning as method in learning process.

Originality/value: This concept paper produce the effectiveness of multimedia learning in help improve the students' performance.

Keywords: Student performance, Students Access, Traditional Learning, Multimedia Learning;

Introduction

In the process of teaching and learning there are a variety of methods and activities used. The purpose is to achieve the objectives learning and teaching. In traditional teaching, the method used is face-to-face activity focuses on oral communication activities between students with instructors (David 2009; Khan and Jumani 2012; Kavita et al., 2014). The teaching and learning process is implemented at the same time and place to get information from instructor, teachers and friends. (DeShea Simon 2013). This learning process affects the performance of some students (Kavita et al., 2014). Learning and teaching in traditional ways makes students feel less interested and focus during the process of teaching and learning also students places an inactive role rather than an active one (Kavita et al., 2014).

ICT in teaching and learning provides many facilities than traditional method like online activities, interactive learning material, e-forum discussion and evaluation quiz. The use of ICT in education is one way to increase student academic performance and quality of the teaching and learning process (Stack, Steven 2015). Earlier developments on e-learning have involved computer-based assessment platforms for teaching and learning (Rodríguez et al., 2013; Soler, 2010, 2006). According to (Norazlina et al. 2007; Talhi and Djoudi 2011; Hua et al., 2011) multimedia learning provides learning content to improve their learning outcome. The Multimedia teaching and learning can change the transmission mode and changes the mode of activity in the teaching and learning process such as exchange ideas among them, performing open discussion and getting more information (Simon et al 2013). The content multimedia learning is applied using Moodle as an open source systems that emphasize online learning applications. Selection Moodle use in producing learning material has been proved by Jamaluddin and Zawanah (2010) who claim educators, trainers, students and education institutions have chosen Moodle as a medium to communicate within the community, to share teaching materials, design quizzes and so on.

The rest of this paper is organized as follows. Section 2 describes the literature review on traditional teaching and learning method; multimedia teaching and learning method. Section 3 describes the methodology used for this project. Section 4 describes the experiment results. Finally, the discussion and conclusion of this work is described in Section 5.

Literature Review
Teaching and Learning Process
In the early stages of learning require guidance and assistance from a teacher and educator. According to (Neo and Rafi, 2007; Falih et al; 2016; Hanim and Rosman, 2010; Noor Hisham 2011; D.Simon et al; 2013; Fei Li et al; 2014), in the teaching and learning process, transmission of the message to the learners is based on the lecture of teacher's and the traditional methods associated with teacher-based instruction or teacher cantered. Therefore, the learners tend to be passive and students play a small role in the learning process (Orlich et al., 1998; Sidin and Mohamad 2007; Kavita Saini et al; 2015). Traditional methods only is using text as this view of teaching materials and poor which led content. This fact is stated by the Sawsan Nusir et al. (2012) who defined the traditional teaching methods are quiet poor at providing such context. Stated by (Siti Hawa and Aini 2007; Azin Nouri et al; 2012), one of the main criticisms raised against the traditional approach is that students feel bored and do not obtain meaningful learning style from the experience of learning something.

Multimedia Teaching and Learning
According to Manjit and Ramesh (2006), education benefits offered by multimedia technology include the ability to take the user into otherwise inaccessible environments with traditional methods. With multimedia, information communication can be done in a more effective and it can be an effective teaching medium for conveying information. Communication is easier to use, it is necessary to determine the ease of navigation required to be included in the teaching and learning (Malalasekera and Walsh, 2007; Wai Kit Wong and Poh Kiat Ng 2016). Aspects of multimedia support student-centered learning in which students are responsible is a strategy in their own learning process (Vasudha and Jayashree, 2009). According to Abbas (2012), people learn better from words and pictures than from words alone. The use of multimedia elements can stimulate the human senses. (Wang et al. (2005); Mayer, 2005; Manjit and Ramesh, 2006; Kim and Gillman, 2008; Rizal, A. et al., 2009; Kavita Saini et al; 2014; Fei Li et al 2014). According to (Talhi and Djoudi 2011; DeShea Simon et al; 2013;) multimedia learning uses authoring tools to provide learning content to improve their learning outcome. The interactive multimedia helps student to be more creative in thinking during learning process.

Moodle as Platform for Multimedia Learning
Moodle (Modular Object-Oriented Dynamic Learning Environment) designed by Martin Dougiamas based on the principles of teaching (Hua et al., 2006) is an open source course management system (CMS) also known as a Learning Management System (LMS). Moodle was designed to help educators and learners to develop e-learning tools. Moodle allows users to post news items, assign and collect assignments, post electronic journals and learning resources. According to Ismail and Norjannah (2010), Moodle special features they'd like to include materials of e-learning photosynthesis to learning more comprehensive and interactive features.

Research Method
The research method used two methods teaching and learning; traditional learning and multimedia learning. The methodology of the research undertaken to examine traditional learning in terms of the level of student achievement, use of learning materials and methods of teaching. The concept of learning traditional is using chalk and talk and it's less interest to students during learning and teaching process. Research conducted are about student perceptions of traditional learning, effectiveness in traditional learning and student perception in traditional content. In traditional learning only used the face – to face method between lecturer and student. Lecturers only give the lecture about 2 hours per session in 4 hours per week.

To convert the traditional learning to interactive multimedia learning is a use of e-learning and blended learning. Moodle is a platform that is used for e-learning that has various interactive features in the provision of material learning multimedia such as words, power point and video. Students are free to choose the format in which they can easily understand. In e-learning, students are provided with the ease of quiz and forum.
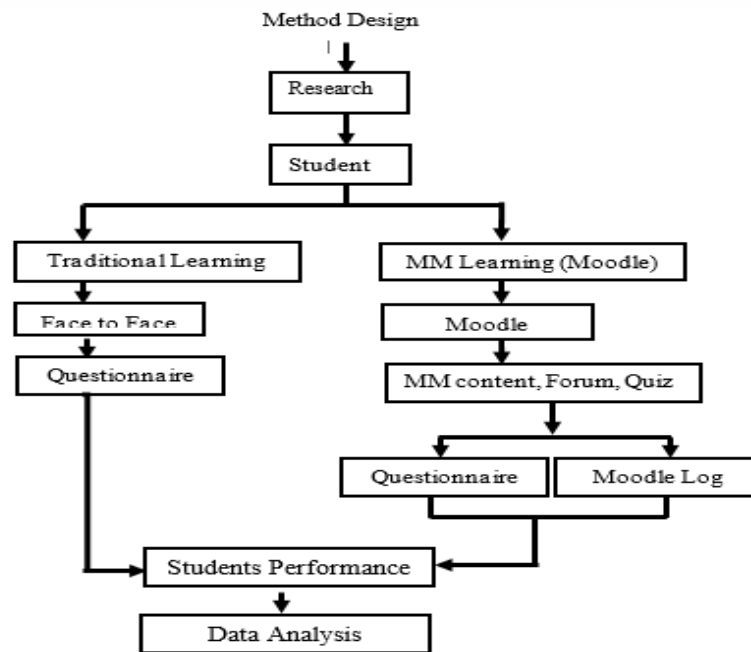

Figure 1: A Research Framework

The implementation of e-learning is using the Moodle platform. The learning content available in Moodle includes learning materials throughout a semester within about 14 weeks such as notes quiz and forums. Students will be given a user name and password in order to access e-learning. The preparation of these notes can give them the freedom to access at any time. Assignments and tutorial are also available for download on Moodle to facilitate student access. Forum are platform provided for student in discussing the topic that related to the subject. Quiz provided by chapter implementation of learning. Students are given questions and lecturers set time period for students to answer the quiz. Students will receive feedback and scoring on completion of the quiz. The preparation of quizzes in e-learning we can see the performance of students through each chapter learning. These methods also help to make student more active during and after

teaching and learning session. Apart from that, it is a research on the use of multimedia learning methods on the performance of student learning.

Data Description
Population and Sample
Populations of this study are among the students under program Diploma Science Computer (Multimedia) at Widad College Kuantan Pahang. The sample consisted of student's semester 4 taken the subject DDZ2543 (Instructional Design Technique and Authoring Tools). The sample is divided into two groups, Group A (n = 30) using traditional learning methods. Group A were given the questionnaire to obtain data on the use of learning methods and group B (n = 20) using multimedia learning method. While group B was given questionnaires and also obtain data through log data in Moodle. The purpose is to know and compare the benefits and effectiveness of using all teaching method. The questionnaire is developed and measure using five point Likert scale range: 1-Strongly Disagree, 2- disagree, 3- neither agree, 4- agree and 5- strongly agree. The data obtained are translated into specific codes that will represent the variables as in the questionnaire. Data were analyzed using descriptive analysis methods such as frequency, percentage and mean.

Pattern Data Collection
The data collection on the 4th semester students who take the subject DDZ2543 in Widad College. Production Moodle provides teaching materials such as notes, quizzes, forums and chatting. The development of quiz to identified i) the students' whether achievement or not after using Moodle in teaching methods ii) the level of student achievement through frequent use Moodle. The frequency of using Moodle determinant of student success as a student achievement. The pattern student access Moodle based on characteristics: i) frequency ii) per week iii) time access iv) student result.

Findings
In traditional method the data collected by questionnaire. The questionnaire is divided into effectiveness in traditional learning and student performance in traditional learning. The questionnaire for multimedia learning is divided into the student knowledge in e-learning, student's performance at multimedia learning and student's perception in Moodle.

Traditional Learning (Face to Face)
The results show that 30.0% of respondents strongly disagree and 36.7% disagree about "The traditional learning was interesting and pleasant to use". Through this finding, known that most of the respondents 26.7% strongly disagree by the statement that "The interesting content in traditional learning delivery methods". Traditional learning helps me improve in understanding the subject that I take. In that statement the finding indicated that (min 2.5) the respondent disagree with that statement in 53.3% are disagree. Most respondents 50.0% disagree state the traditional learning enhancing students' interest in learning sessions and 33.3% respondent also strongly disagree with traditional learning is not boring.

Table 1: Student Perception in Traditional Learning

No.	Student Perception in Traditional Learning	SD %	D %	NA %	A %	SA %	MIN	MIN **
1.	The traditional learning was interesting and pleasant to use.	30.0	36.7	6.7	23.3	3.3	2.3	-
2.	The interesting content delivery in traditional learning method.	26.7	20.0	23.3	20.0	10.0	2.8	3.5
3.	Traditional learning teaching helps me improve in understanding the subject that I take.	13.3	53.3	10.0	13.3	10.0	2.5	3.58
4.	The use of traditional learning methods makes me more interested in learning sessions	23.3	50.0	3.3	16.7	6.7	2.3	-
5.	Learn to use this method not boring me	33.3	16.7	16.7	23.3	10.0	2.6	3.75

* SD - Strongly Disagree, D – Disagree, NA - Neither, A – Agree and SA – Strongly Agree

The results for the effectiveness of traditional learning showed that 30.0% do not agree about the "Traditional learning is more understand". The mean score is 2.7. Item 2 (mean 2.8), the statement is "This method and technique is more interesting" with the number of 10.0% strongly disagree and 40.0% disagree. Through the traditional learning also 60.0% respondents disagree about the item "I'm easy to understand and remember the content of Learned" (mean 2.5). An analysis study found that, overall means were 2.8 and 50.0% disagreed about the statement "I had easy access to learning materials and reference materials". 50.0% disagree about the fact of use traditional learning methods are difficult to understand. However, 23.3% the respondents agreed and 13.3% strongly agree with this statement. A mean is 2.8. Through traditional learning "This method of learning (traditional) cans makes me more creative" (mean 2.7) percent strongly disagree is 20.0% and disagree 43.3% compared to agreed only 16.7% and 20.0% strongly agree. While item 7 (mean 2.7) statements that the traditional learning "Easy for my own revision upon completion of the learning session" with 23.3% strongly disagree and 40.0% disagree.

Table 2: The Effectiveness of Traditional Learning Method

No.	Questions	SD %	D %	NA %	A %	SA %	MIN
1.	Traditional learning is more understandable.	13.3	30.0	6.7	30.0	20.0	2.7
2.	This method and technique is more interesting.	10.0	40.0	13.3	26.7	10.0	2.8
3.	I'm easy to understand and remember the content learned.	10.0	60.0	6.7	13.3	10.0	2.5

		SD	D	NA	A	SA	mean
4.	I had easy access the learning materials and reference materials.	6.7	50.0	6.7	23.3	13.3	2.8
5.	I find it more difficult to understand using traditional methods of learning.	6.7	50.0	6.7	23.3	13.3	2.8
6.	This method of learning (traditional) can make me more creative	20.0	43.3	-	16.7	20.0	2.7
7.	Easy for my own revision upon completion of the learning session.	23.3	40.0	-	16.7	20.0	2.7

* SD - Strongly Disagree, D – Disagree, NA - Neither, A – Agree and SA – Strongly Agree

The table below shows the student performance using traditional learning. Data was collected from student semester 4(20paxs). The assessment marks in 40%. From the data below the max marks students get is 27% (2pax) and min is 16% 91pax). On the average, only 5 students scored 25% of the 20 students.

Table 3**:** Student Performance uses Traditional Learning Method

No.	Student	Course Marks (40%)
1	Student A	25
2	Student B	23
3	Student C	24
4	Student D	25
5	Student E	25
6	Student F	27
7	Student G	26
8	Student H	23
9	Student I	27
10	Student J	22
11	Student K	23
12	Student L	20
13	Student M	24
14	Student N	18
15	Student O	22
16	Student P	24
17	Student Q	21
18	Student R	16
19	Student S	25
20	Student T	25
	Average:	**23**
	Min:	**16**
	Max:	**27**

Multimedia Learning Using Moodle
From the results finding, "This module Helps in the process of teaching and learning" (mean 4.3), most of the respondents hereby agree on 50.0% and 45.0% strongly agree. 60.0% agreed

479

and 35.5% strongly agree when it is said that "Examples available in the module easy for me to understand" in multimedia learning. The mean score was 4.3. Whereas 45.0% respondent strongly agree and 45.0% disagree to say that through multimedia learning "The use of multimedia modules is one way to attract students to concentrate in class" (mean 4.3). The results of the study found that 65.0% agree and 30.0% of the respondents strongly agree using multimedia learning "The information presented in this module is easy for me to understand". Respondents very contented with land subsidence information obtained through e-learning. Where 45.0% agree and strongly agree. The average score was 4.3.

Table 4: The Student Perception of the Multimedia Module Content in E-Learning

No.	Questions	SD %	D %	NA %	A %	SA %	MIN	MIN **
1.	This module helps in the process of teaching and learning	-	-	5.0	50.0	45.0	4.3	4.2
4.	Examples available in the module easy for me to understand	-	-	5.0	60.0	35.0	4.3	4.0
5.	The use of multimedia modules is one way to attract students to concentrate in class	-	-	10.0	45.0	45.0	4.3	3.7
7.	The information presented in this module is easy for me to understand	-	-	5.0	65.0	30.0	4.2	4.0
8.	I am satisfied with the information obtained	-	-	10.0	45.0	45.0	4.3	-

* SD - Strongly Disagree, D – Disagree, NA - Neither, A – Agree and SA – Strongly Agree
** MIN - Benchmarking from another result.

Most of the respondents are adept at using Moodle 60.0% agreed that "I am very skilled at Using Moodle" (mean 4.2). Meanwhile 60.0% of respondents agreed where they always use Moodle at home. 50.0% of respondents agreed and 40.0% strongly agree with the mean rate of 4.3 where respondents are comfortable using Moodle in learning. Through the use Moodle as e-learning as much as 50.0% agreed and 40.0% strongly agree that using this method is easy to get learning materials (mean 4.3). Using Moodle respondent able to save time to get learning materials 55.0% strongly agree and 40.0%. Weighted average rate is 4.5.

Table 5: The Student Perception in the Multimedia E-Learning Using Moodle

No.	Questions	SD %	D %	NA %	A %	SA %	MIN	MIN **
1.	I am very skilled at using Moodle	-	-	10.0	60.0	30.0	4.2	4.2
2.	I always use Moodle at home while learning	-	-	10.0	60.0	30.0	4.2	-
3.	I am very interested and comfortable using Moodle	-	-	10.0	50.0	40.0	4.3	3.74

|						
4. I had easy access to learning materials using Moodle	-	-	10.0	50.0	40.0	4.3	4.4
5. Save time to get learning materials using Moodle.	-	-	5.0	40.0	55.0	4.5	-

* SD - Strongly Disagree, D – Disagree, NA - Neither, A – Agree and SA – Strongly Agree

** MIN - Benchmarking from another result.

Frequency of Students Access in Moodle by Learning Material

Preparation Moodle as e-learning in particular providing various forms of multimedia material as a reference and guide students. Materials are provided as notes, quizzes and forums. The results showed that the frequency of use the material provided to the students. Forums, quizzes and view course materials are most frequently accessed by students. Figure 4.2 shows the frequency of students access Moodle by material. The higher student's access is a quiz (544) and the second highest is forum (531) than the third is course view (476). Only (220) frequent access by students is noted.
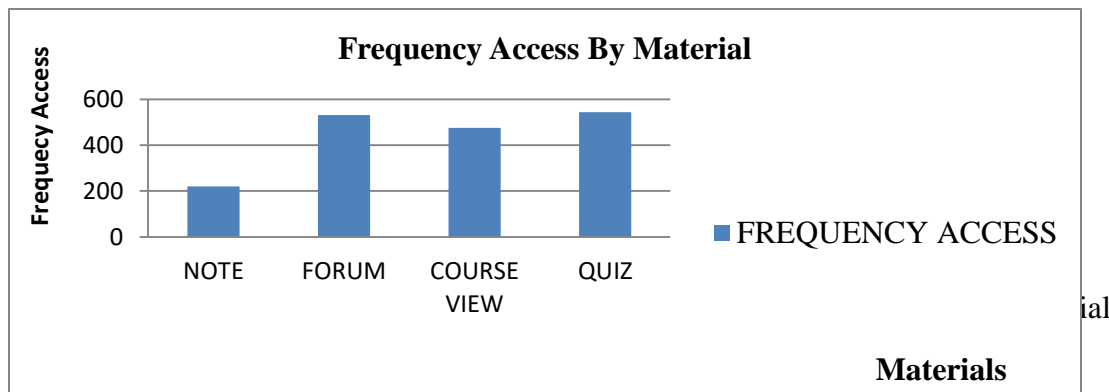
Frequency of Students Access Moodle by Time and per Week

Based on the data collection from Moodle log mostly students like access Moodle at 2.00 pm – 4.00 pm and 10.00 pm – 12.00 pm.

Table 6**:** Frequency Student Access Moodle by Time

	PM							AM			
12.00 pm	1.00 - 2.00 pm	2.00 - 4.00 pm	4.00 - 6.00 pm	6.00 - 8.00 pm	8.00 -10.00 pm	10.00 - 12.00 pm	12.00 - 2.00 am	2.00 - 4.00 am	8.00 -10.00 am	10.00 - 12.00 am
5	11	19	14	8	14	16	8	7	6	14

Through this study found that, the frequency of students using Moodle in a week also affect student performance. Table 4.8 shows that the majority of student's access Moodle 4 times a week. This proves that students prefer using Moodle as a learning method.

Table 7: Frequency Student Access Moodle by per week

Per Week	Never Access	1	2	3	4	5	6
Frequency	1	0	2	4	9	2	4
Total	22						

Based on this finding, student performance using multimedia learning is much better than using traditional learning. Refer table 4.9 the percentages student performance in different method. 55% student score A in multimedia learning method compared to 0% student in traditional method score A. The percentage for highest grade student score in traditional method is grade C in 50%.

Table 8: Students Performance in Multimedia Learning and Traditional Learning

Marks	Grade	MM	%	Traditional	%
30-40	A	11	55	0	0
25-29	B	5	25	8	40
20-24	C	3	15	10	50
15-19	D	0	0	2	10
10-14	E	1	5	0	0
		20	**100**	**20**	**100**

Through e-learning can assess student performance by providing a log report. In assessing the performance of students through e-learning we leverage the capabilities of e-learning in integrating evaluation in the teaching process. According to a study conducted most of the students agree and prefer to use e-learning. Preparation of teaching materials in various formats in the e-learning makes students interested in using it as a reference. Frequency of access of e-learning students, particularly the use of learning materials has been shown to increase student performance. Tables 5.19 show that, student's access is also significantly correlated to the students' performance.

Table 9: Correlations Students Performance between Students Access

Correlations			
		Std_performance	Std_access
Std_performance	Pearson Correlation	1	.742**
	Sig. (2-tailed)		.000
	N	22	22

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion and Conclusion

Through the use of multimedia teaching learning can provide a variety of learning materials in a more interactive format. Preparation of notes in a visual format, power-point, video, and animation to attract students and help students easily understand the learning content. Use online multimedia learning facilitate students get learning materials at any time and students can make arrangements prior before lecture time. Multimedia learning is not only just related download lecture notes but covers a wider scope so that it can promote active learning outside the class. This could attract students to access more frequently in multimedia learning system and thus have an impact on application development. The achievement level of students using multimedia learning was better than students using traditional learning. The result shows the relationship between the use of multimedia learning in the classroom with students' academic achievement levels are high relevance and strong relationships. Future research needs to take into consideration the behavior of students on the use of traditional learning and e-learning methods. Is the behavior of a student is one of the factors in determining the effectiveness of a learning method. For example, student behavior for the level of content satisfaction in teaching materials used in traditional and e-learning. Addition research is also needed to determine the student behavior are effected on student performance.

References

Abbas, P. G. (2012). *The significant role of multimedia in motivating efl learners interest in english language learning.* Modern Education and Computer Science

Abdul Malik, M., Murtaza, A. and Khan, A. M. (2011). Role of teachers in managing teaching learning situation. interdisciplinary, *Journal of Contemporary Research in Business Institute of Interdisciplinary Business Research,* 3(5), 783-833

Abu Ziden, A. Mohd Ali, A. S. and Mohammad Fuzi, M. M. (2012). E-Forum: Platform perbincangan ilmiah. *Jurnal Teknologi Pendidikan Malaysia,*2(2),5-10

Bawaneh, S. S. (2011). The effects of blended learning approach on students' performance: Evidence from a computerized accounting course. *International Journal of Humanities and Social Science,* 1(6),63-69

Dinica, M., Dinescu, L. and Miron, C. (2012). *The use of multimedia technologies in approaching the physical phenomena from interdisciplinary perspectives.*

Falih M. Alsaaty et al; (2016). Traditional versus online learning in institutions of higher education: minority business students' perceptions*, Business and Management Research,*5(2) 31-41

Harun, J. and Hamzah, I. (2010). Gaya pembelajaran dan kesannya terhadap penglibatan pelajar tahun akhir kursus spp, spk dan spt fakulti pendidikan dalam persekitaran e-pembelajaran*. Journal of Science & Mathematics Education* . 1-11

Isa, A. (2010). Construction of a multimedia – learning environment: Secretarial students experience. *Continentals J. Information Technology* ,4, 9-14.

Jalal, A. and Zaidieh, Y. (2012). The use of social networking in education: Challenges and opportunities.*World Of Computer Science And Information Technology Journal* (Wcsit). 2(1), 18-21, 2012. Issn: 2221-0741

Khan, S. B. and Jumani, N. B. (2012). E-learning versus traditional learning in Pakistan. Asian *Journal of Distance Education*, 10(1),28 – 34

Li. F, Qi. J, Wang. G and Harbin X.W (2014). China traditional classroom VS E-learning in higher education: Difference between students' behavioral engagement, *International Journal of Emerging Technology in Learning*,9(2),48-51

Lingi, S.W, Yuen, M.C and Chuah, K.M. (2012). Optimizing multimedia learning objects for learning in a procedural-based course. *International Conference on Management and Education Innovation IPEDR*.37

Mai Neo and Tse-Kian Neo. (2008). Students' perceptions of interactive multimedia mediated web based learning: A Malaysian perspective. *Proceedings Ascilite Melbourne* 2008, 658-659.

Malalasekara, A. and Walsh, S.J. (2007). Comparison of Approaches to a Multimedia Presentation. *Conference ICL Villach, Australia.*

Manjit Sidhu, S. and Ramesh, S. (2006). Multimedia learning packages: Design issues and implementation problems. *Malaysian Online Journal of Instructional Technology* (MOJIT),3(1),43-56

Neo, M. and Rafi, A. (2007). Designing interactive multimedia curricula to enhance teaching and learning in the Malaysian classroom- from teacher-led to student-centered experiences. *International Journal of Instructional Media*. 34(1): 51-59.

Nordin, S. and Mat Daut, N. L. (2010). *Membangunkan Bahan E-Pembelajaran Berasaskan Moodle Bagi Tajuk Dinamik Tingkatan Dua* ,retrieved from http://eprints.utm.my/id/eprint/10207/1/Nur_Liyana_binti_Mat_Daut.pdf

Sadiyati, M. and Taghiyareh, F. (2008). E-Learning: From a pedagogical perspective. *International Journal of Information Sciences and Technology.*

Saini, K. Wahid, A.and Purahit, G.N (2014). Traditional learning versus web based learning: Performance analysis *(IJCSIT) International Journal of Computer Science and Information Technologies*, 5 (4), 5182-5184

Simon. D, Jackson. K and Maxwell. K. (2013) Traditional versus online instruction: Faculty resources impact strategies for course delivery, *Business Education and Accreditation*, 5(1),107-166

Stack and Steven (2015). Learning outcomes in an online vs traditional course, *International Journal for the Scholarship of Teaching and Learning,* 9(1),1-18

Rodríguez, J.C.F., Granados, J.J.R and Muñoz, F.M. (2013). Engineering education through e-Learning technology in Spain. *Int. J. Artificial Intel. Interactive Multimedia*, 2, 46-50. DOI: 10.9781/ijimai.2013.216

Rosli, M., Ismail, I., Baharum, H. and Abu Ziden, A. (2012). The effectiveness learning materials and activities in e-learning portal. *Malaysian Journal of Distance Education* 14(1), 1724

Sen, T. K. (2011). Application of blended and traditional class teaching approach in higher education and the student learning experience. *International Journal of Innovation, Management and Technology,* 2,(2),107-109

Setapa, M., Rahman, K. and Mohammad, N. (2012). *Factors that affect student performance: the implementation of the i-learn at a local university*. 3rd International Conference on Business and Economic Research (3rd Icber 2012)

Talhi,S. and Djoudi, M. (2011). Developing adaptive e-learning: An authoring tool design. IJCSI *International Journal of Computer Science Issues*, 8,(5),92-100

Tanya. (2011). Learning Analytics: Definition, process and Potential. *Creative Common Atribution*. 2-3.

Wong. W. K. and Ng. P. K (2016). An empirical study on e-learning versus traditional learning among electronics engineering students, *American Journal of Applied Sciences,* 13,(6),836.844