Blended Learning: Readiness Study among Mathematics and Statistics Lecturer in UiTM Cawangan Pahang

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***Abstract*— Ever since the existence of ITM way back in 80's, Mathematics has always been part of the curricula. Mathematics is offered in various programs as the core or non-core courses. During the early day, teaching method was using a conventional mode of chalk, board and talk. As the technology evolved very fast, does it affect Mathematics education? This paper reports on the how far educators play their degree of involvement in using technology in Mathematics education. The conclusion is presented in determining the lecturers' preference in teaching and learning Mathematics. The data was collected from previous practices in Mathematics education as well as from current practices.**

***Keywords*— *Mathematics Education, Preference, Technology*.**

I. INTRODUCTION

Since UiTM Pahang has been established in 1985 in Kuantan Campus, chalk and board was the mode of teaching and learning that has been used. As technology evolved, the teaching methods also changed. For the past 30 years UiTM Pahang branch has been established, the teaching methods have changed tremendously. It had begun with chalk and board in 1985 followed by marker pen and whiteboard. By 2002, marker pen and whiteboard were fully used. Then, the overhead projector (OHP) and transparency were used since 1993, when Jengka Campus was officially opened. After the digital technology has been available, the personal computer (PC) was placed together with liquid-crystal display LCD projector in the classrooms as well as in lecture theaters. PC and LCD are part of information and communication technology (ICT) tools. These facilities have been used as teaching tools since 2004.

Currently, there are few types of classrooms such as lecture halls, classrooms, computer laboratory, science laboratory, and workshops. All lecture halls and most of the classrooms are accomplished with a set of PC and LCD projector.

Nowadays, the technology helps both educators and students in teaching and learning process. The use of computers enables the lecturers to prepare lessons in the various forms; PowerPoint presentation, graphical, statistical or spreadsheet. The ICT improves the teaching and learning process by making it more attractive. This technology leads traditional teaching and learning to blended learning or flipped classroom. In UiTM Pahang, as reported by i-learn center blended learning was introduced since 2009. The benefit and the flexibility offered by this method soon are gradually realized by many. Through blended learning, the lecturing session can be accessed anywhere and anytime.

The purpose of this paper is to identify the technology that currently uses in teaching and learning Mathematics and Statistics in UiTM Pahang. This paper also reveals the teaching tools that are employed by the lecturers. The awareness and the implementation of blended learning in teaching Mathematics and Statistics also identified.

II. LITERATURE REVIEW

The educational technology involved implementing ideas from various types of sources to create the best learning environments possible to the students (Hooper & Rieber, 1995). Teachers are able to use the technology to empower their understanding and apply the Mathematics ideas in the classrooms. Technology can be utilized in an attractive way to enrich students' learning ability, hence, helping students to understand concepts better.

Besides, the use of computer-aided technology in the classroom will make the learning process more fun for the students (Kumar, Rose & D'Silva, 2008). Indeed, computer technology had begun influencing students' learning experience for more than 25 years ago though it was only in a reasonable manner (Cuban, 2001). Nevertheless, teachers need training not just to improve their skills but to enhance their confidence level in implementing technology in teaching and learning (Aziz, 2007).

In Malaysia, Ministry of Education has introduced the Virtual Learning Environment (VLE) in primary and secondary school (Baru et.al. 2014). Baru (2014) stated that teachers'

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influence is a major factor in adopting technology in classrooms. However, the research found that teachers' readiness towards implementing VLE to replace exercise book in giving task or homework is negative. Teachers should be given many opportunities to attend a workshop to sharpen their skills. It is a big hope that they will be ready to use technology to assist them in teaching and learning.

Technology also can be utilized in the elementary grades to enhance a concrete, experimental approach to mathematical topics, enabling students to have greater success with a more typical, abstract approach later in school (Flores, 2002). This medium helps students to improve their performances in Mathematics. Research done by Lopez (2010) showed that the using of interactive whiteboard technology had reduced the students' performance gap in Mathematics and readings.

Glover and Miller (2001) in their research found that teachers are aware of the use of technology in teaching and learning and they are ready to learn to enhance their knowledge to match the students' needs. However, despite readiness of the teachers in using the technology, it has been underused. A study conducted by Kumar et al., (2008) stated that even though teachers are sent for training to enhance their Information and Communicating Technology (ICT) knowledge, but many have returned and conveyed the teaching and learning using the traditional method. They also found that the actual usage of computer among Mathematics, Science, and English language secondary school teachers were at the moderate level.

III. METHODOLOGY

The data were collected using Google Form online, and the respondents are the Mathematics and Statistics lecturers of UiTM (Pahang). The questionnaire was adapted from Lowerison et al. (2006). The questions were divided into four sections. Section A was collecting the demographic and preferences of the mode of teaching of the lecturers. Section B was for the use of computer in the course teach by the respondents, Section C was for the perceived of effectiveness in the computer usage towards teaching and learning process in their respective courses. Meanwhile, Section D measured the personal use of the computer by the respondents. Section B, C, and D used the Likert scale to measure all the characteristics mentioned. The data collected were then analysed by IBM SPSS Statistics Version 22.

IV. RESULTS AND ANALYSIS

The respondents are the Mathematics and Statistics lecturers of UiTM (Cawangan Pahang). Throughout the 30 years of UiTM (Cawangan Pahang), there are many teaching aids technology have been used. The most significant tools are the blackboard and chalk, OHP and transparency, marker and whiteboard and also PC, laptop, and LCD. The Mathematics and Statistics lecturers were then asked to choose which of these tools they have applied as the mode of their teaching. About 100% of the lecturers have used the marker and whiteboard as it is the current practice in UiTM (Pahang). Meanwhile, 72.2% of these lecturers have used the PC and LCD. Only 11.1% of them have previously engaged in using OHP and transparency as their teaching aid.

TABLE I. CRONBACH'S ALPHA

Section A	Cronbach Alpha
Computer use in course	0.926
Perceived effectiveness of computer use	0.93
Personal computer use	0.953

Prior to the analyses, the reliability test was done for all sections. The Cronbach's alpha yielded a high internal consistency between the items in each section as recorded in TABLE I.

TABLE II. MEAN SCORE FOR COMPUTER USE IN COURSES

Section B: Computer use in course	Mean
1. Instructional Supplements such as drill and practice exercises or tutorials.	1.78
2. Communication such as email, mailing lists, conferencing, ICQ or FirstClass.	1.06
3. Organizational applications such as databases and/or spreadsheets.	0.94
4. Analytical/Programming applications such as statistics, charting, graphing, drafting or robotics.	1.67
5. Expansive uses such as simulations or experiments.	0.50
6. Creative uses such as desktop publishing, digital videos, digital cameras, scanners or graphics	0.67
7. Expressive uses such as word processing or on-line journals.	1.50
8. Evaluative uses such as electronic portfolios.	0.72
9. Informative uses such as Internet, CD-ROM or DVD.	1.56
10. Presentation applications such as PowerPoint and/or LCD projector	2.06
11. Access applications such as a class website or class folder.	1.56
12. Overall, how often was computer technology used in this course?	1.72

Based on the mean score to measure the computer use in the courses, the scores are mostly less than 2. This signifies that most Mathematics and Statistics courses conducted in UiTM (Cawangan Pahang) can be considered as rarely use the computer as the teaching and learning tool. The possible applications in teaching and learning using computer listed in Section B where the respondents need to select whether the application mentioned were seldom, sometimes, often or very often use or else it is not applicable at all. The application for presentation purposes recorded the highest mean score 2.06 which is sometimes are applicable in the teaching and learning process.

TABLE III. MEAN SCORE FOR PERCEIVED EFFECTIVENESS OF COMPUTER USE

Section C: Perceived effectiveness of computer use	Mean
1. Instructional Supplements such as drill and practice exercises or tutorials.	2.67
2. Communication such as email, mailing lists, conferencing, ICQ or FirstClass.	2.33
3. Organizational applications such as databases and/or spreadsheets.	1.94
4. Analytical/Programming applications such as statistics, charting, graphing, drafting or robotics.	2.67
5. Expansive uses such as simulations or experiments.	1.50
6. Creative uses such as desktop publishing, digital videos, digital cameras, scanners or graphics	2.00
7. Expressive uses such as word processing or on-line journals.	1.89
8. Evaluative uses such as electronic portfolios.	1.67
9. Informative uses such as Internet, CD-ROM or DVD.	2.22
10. Presentation applications such as PowerPoint and/or LCD projector	3.11
11. Access applications such as a class website or class folder.	2.44
12. Overall, how often was computer technology used in this course?	2.78

The respondents were then asked to rate the same applications that they used in their courses if any to measure the perceived effectiveness computer use in the courses. The mean scores as reported in TABLE III shows that the scores are mostly less than 3. The same possible applications in learning using computer were listed in Section C as in Section B where the respondents need to choose whether the application mentioned were very ineffective, ineffective, neutral, effective and very effective or else it is not applicable. The application for presentation purposes recorded the highest mean score which is 3.11, this shows that most of the lecturers gave positive remark on the effectiveness of the application as a teaching aid. Whereas, due to lack of use, the mean score for the perceived effectiveness of the others application poorly rated by the lecturers.

TABLE IV. MEAN SCORE FOR PERSONAL COMPUTER USE

Section D: Personal computer use	Mean
1. Computers make my job as an instructor a lot easier.	3.89
2. Computer technology is useful for other classes that I teach and/or my career.	4.00
3. I enjoy working with a computer.	3.78
4. Computers help me to teach the material in a meaningful way	3.78
5. Computers make it easier to collaborate with students other instructors.	3.67
6. I can always find a computer to work on when I need one.	3.28
7. My teaching experience in this course was facilitated with the use of a computer.	3.44
8. I used a computer for this course because I had to not because I wanted to.	2.61
9. The use of computers improved the quality of my work.	3.83
10. The computer technology used in this course did not work the way that it was supposed to.	2.89
11. Using computer technology was necessary for me to do a good job in this course.	2.89

In order to keep abreast with the technology development in teaching, the opinion of the lecturers towards their personal computer use in their daily life was collected. The Likert scale ranging from 1 to 5 (strongly disagree to strongly agree). Based on the result from TABLE IV, the lecturers admit that computers make their job as the instructor a lot easier. Other statements also were rated toward positivity by the lecturers where the mean scores are at least 3.20 and above.

TABLE V. TEACHING TOOLS USED

Teaching tools	Percentage
Blackboard and chalk	5.9%
OHP & Transparency	5.9%
Marker & Whiteboard	94.1%
PC & LCD	52.9%
Laptop & LCD	29.4%
Blended Learning	41.2%

At the end of the survey, the respondents were required to choose their teaching tools that have been used throughout their service. The most popular teaching aid chosen by the Mathematics and Statistics lecturers are marker and whiteboard at 94.1%, followed by the PC and LCD at 52.9%. The combination of both blackboard and chalks and OHP and transparency are the least used mostly those who were appointed before the year 2003.

For the awareness of the blended learning, about 82.4% of the Mathematics and Statistics lecturers are aware of blended learning as part of the technology used in teaching and learning. From the percentage of the lecturers that aware of the blended learning about 92.9% of them used i-Learn a learning management system (LMS) as the medium in their teaching and learning process.

TABLE VI. BLENDED LEARNING IMPLEMENTATION

Readiness	Yes	No
Do you ready to implement blended learning?	58.8%	41.2%
Have you implement blended learning?	41.2%	58.8%

About 58.8% of the respondent stated that they ready to implement the blended learning and about 41.2% had implemented blended learning as one of their mode of teaching.

V. DISCUSSION AND CONCLUSION

Based on the results, 100% of the current practice in UiTM (Cawangan Pahang) in teaching Mathematics and Statistics is using the whiteboard and marker pen. Only a few percentages starting to embrace the technology in their teaching process as the technology would always be blooming with a greater invention. The teaching and learning Mathematics and Statistics soon would also be affected by the changing

technology. This research gives the overview of the teaching aids currently used by the Mathematics and Statistics lecturers in UiTM (Cawangan Pahang) in 30 years. From the personal use of the computer, the mean score for the question 'I can always find a computer to work on when I need one' is only 3.28 which are only fair. In order to fully integrate the technology with teaching and learning, the score should be at a higher level. The opinion of the lecturers towards 'Using computer technology was necessary for me to do a good job in this course' is only 2.89 which are less than fair. This implies that at present, the lecturers mostly prone to not agree that the computer was necessary for teaching Mathematics and Statistics. This result supports that currently, only 58.8% of the Mathematics and Statistics lecturers are ready to implement the blended learning approach.

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