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The Effectiveness of REVT Education Video In Algebraic Learning In Port Dickson Polytechnic

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Abstract

This study presents the results of learning algebra achievement among students of Politeknik Port Dickson by using video-based teaching materials developed by the technical development of video REVT *(Rapid Educational Video Technique).* The use of video is able to promote the Student-centered Learning (SCL) and *Blended Learning* strategies in the CIDOS e-learning platform. SCL is able to produce more active and competitive students to gain knowledge. In addition, the use of this video is also able to diversify the teaching methods of lecturers in order to motivate and attract learning. A total of 39 respondents was involved that include 13DET1A and 26 DKA1E students for the academis sessionsin Jun 2018. It showed an increase of 27.2% achievement in grasping Algebra topics. The group of students using additional form of video teaching was found to have better results compared to the group of students who follow the teaching and learning in traditional. The video production technique of REVT can also save 40% of educational video production . In Conclusion it was found that learning through video REVT seem an appropriate and effective method to be used by lecturers of polytechnics to enhance understanding, interest and focus among students of DBM1013 Engineering Mathematics 1 course in Algebra topics.

Key-word: video teaching, mathematic, REVT

1. Introduction

The presence of Industry 4.0 is sure to happen and its impact has come to light on the whole world including Malaysia. Hence, the teaching and learning process should be in line with the current development and technological advances. Pedagogy of teaching and learning should be changed in accordance with the development of cyber technology and access to the advanced internet and broadband. Conventional teaching methods in the form of "chalk and talk" seem less attractive to students. Hence a more dynamic and creative method of teaching relevant with the current teaching should be developed. Technological advancement as well as student capabilities should be blended in the best possible way to optimize the potential amongst students in the country . Along with the development of blended learning in education, video has become popular among educators. Combining multimedia elements such as text, graphics and audio have proven to attract students' attention and interest and can stimulate visual and auditory senses. In line with the strategy to implement Student Centered Learning or SCL, the responsibility of students should be emphasized. The lecturer will only plays the role of a counselor or facilitator. Therefore, students interest should be given importance in the preparation of teaching aids. The use of video as a teaching aid to assist lecturers in delivering lessons in addition to providing a new experience to a selected number of students. Video media allows students to feel as though they are in a classroom learning environment . Video can also help in the formation of attitude and personality of students.

Students become more responsibe and be more focused in their learning. The learning process can also be repeated several times (according to student needs and acceptance) in case the students still do not understand the method in solving questions.

2. Methodology

The development of an educational video is not an easy process , in fact it takes a lot of time and energy. Therefore , a neat and systematic planning should be made available at the earliest stage of development to ensure that educational videos can be completed within a short period of time. In the process of developing educational videos, there are various approaches or models that can be followed. This study has been using the *Rapid Educational Video Technique* (*REVT*) which is the latest tablet recording technique as well as video editing applications that are capable of editing quickly and easily.

Video learning mathematics developed in this study uses the 9.7-inch iPad hardware model 2018 with Apple Pencil. Videos are recorded with voice with an iPad internal function called "Screen Recording". Methods of solving math questions are shown by writing down the working on the Microsoft OneNote app with Apple Pencil. The recording video is then edited and blended with background music with the Splice app. Videos are then loaded onto the CIDOS *eLearning* platform . Comparisons were made with the video editing conventional education practiced at the Polytechnic Port Dickson that use Adobe Premier 11 with a digital video recorder. The time taken to produce a 5 minutes video was recorded and analized. Production cycle that includes the recording process, editing and format conversion was standardized for the purpose of comparison in this study. In this study, researchers want to identify whether the use of video can help increase the understanding and interest of students in Algebra topics. The independent variable refers to the use of video in teaching and lesson of Algebra while the dependent variable refers to the change in the achievement of learning outcomes and the level of understanding of the students after attending the learning session withvideo material .

This study uses an experimental quasi design involving two sets of measurement instruments namely quiz questions and questionnaires. Subjective items used in quiz question 1 is based on the syllabus of the course DBM1013 Engineering Mathematics 1 while the questionnaire used contains items that look into the interest and understanding of students during teaching and learning using a thematic Engineering video. The questionnaire consists of 10 items with 5 scale as shown in Table 1 to be answered by the students based on their perception.

Table 1 . Five Points Likert Scale

Score	Category
1	Strongly disagree
2	Do not agree
3	Not sure
4	Agreed
5	Strongly agree

The researchers divide samples into two groups of students namely control group (DKA1E) and experimental group (DET1A) from two different classes from June 2018 sessions . The control group consisted of 26 students DKA1E while the experimental group 13 students from DET1A. The control group is the group of respondents who underwent traditional teaching and learning methods that is by using the module and only involves one-way interaction between lecturers and students during lectures. As for the experimental group, this represents group of respondents who carry out traditional activities of teaching and learning during lectures, and the use of video in learning through CIDOS platform after the lecture sessions.

Quiz Question 1 is used to meet the requirements of Assessment Specification Table (AST) in the syllabus and used as a test of achievement. Question Quiz 1 was conducted separately by using two sets of different quiz questions but with the same level of difficulty to determine the level of understanding of students on the topic of Algebra. To measure the level of interest of the students, the researcher distributed questionnaires to the students of the experimental group who had been in the teaching and learning session using video-assisted teaching methods.

Data obtained from the study were analyzed using Statistical Packages for the Social Science (SPSS) version 23.0. Then, the achievement of both groups was analyzed by scale level as shown in Table 4 to obtain mean value and standard deviation. The mean value between the two groups was compared to identify the effectiveness of video use in teaching and learning. For questionnaire instrument, data analysis was done using min and standard deviation obtained descriptively.

Table 2 . Achievement score and scale level

SCORE OF ACHIEVEMENTS	LEVELS
16 - 20	Excellent
11 - 15	Good
6 - 10	Simple
0 - 5	Weak

4. Analysis And result

The findings of the study will be discussed based on the objectives of the study, namely (i) the effect of using video teaching methods in improving students ' academic achievement on the topic of algebra and (ii) the effect of the use of video teaching methods in enhancing students' mastery for the topic of Algebra .

4.1 . Effects of video Method in increasing Understanding among Students towards Algebra

All data obtained in this study have been analyzed statistically. The data obtained are presented in the tables below.

Table 3. Quiz Score 1 for experimental and control groups Session June 2018

Score	Control (DKA1)	Experiment (DET1A)
Weak	19%	8%
Simple	23%	0%
Good	67%	23%
Excellent	35%	69%

Referring to Table 3, the experiments group using video teaching methods was found to have performed better than the Control Group tought by teaching and learning using traditional ways. The percentage of students who followed the traditional methods achieve an excellent score of 35%, compared to an excellent score of 69% by the students using the video methods of teaching.

Table 4. Min score Quiz 1 for experimental and control groups

Group	Min Score	Standard deviation
Control Group (N = 26)	11.06	6.07
Experiment Group (N = 13)	16.5	4.446

With reference to Table 4, the control group achieved mean score and standard deviation of M = 6.11, SD = 6.07. As for the experimental group, the mean score and standard deviation of M = 16.5, SD = 4.446 showed there is a greater understanding of the topics studied. Learning by video shows the a 27.2% increase in terms of achievement of learning outcomes for Algebra topics.These findings show that the use of video in teaching Algebra topics give better effect than the use of traditional methods in the students' understanding towards Algebra.

4.2 . Student Perceptions In Mastering For Algebraic Topics using Video.

Table 5 . Min pre and post test scores for experimental groups

Item	Min	Standard deviation
1. Learning through video helps me understand Algebra topics .	4.32	0.524
2. I am confident in answering questions related to Algebra.	4.22	0.336

Referring to item 1 in Table 5, the experimental group (DKA1E) achieved mean score and standard deviation of M = 4.32 , SP = 0.524. This shows that the use of video in the teaching of Algebra topics gives a better impact than the use of traditional methods in enhancing students' understanding. Item 2 records the mean score and standard deviation of M = 4.22, SD = 0.336. This finding explains that the use of video improves students' confidence in solving Algebra questions.

4.3. The effectiveness of the REVT method in helping lecturers develop teaching videos

Table 6 . 5 minute video development time

Process	Conventional (Adobe Premier & Digital Video Camcorder) Time (minutes)	REVT (*Rapid Educational Video Technique*) Time (minutes)
Inventory	15	0
Recording	5	5
Editing	25	5
Rendering	15	10
Total	**60**	**20**

Referring to Table 6, the method of producing educational video conventionally requires at least 60 minutes to complete one educational video with a duration of 5 minutes; while the REVT method only takes 20 minutes . This shows that the REVT method is more time-saving and does not burden lecturers in producing educational video.

5. Conclusion

The results of this study showed that using by video, understanding of students in Engineering mathematics particularly the Algebra topic can be improved. This is because by watching the video given especially the Algebra topic can increase the willingness of students to learn. This can improve the learning process because students learn more actively compared to the traditional method. When the learning process happens actively, it gets student's attention and eventually can attract students to continue learning. As the result of it can change the perception Engineering Mathematic from difficult one to a subject of interest. Eventually it will be able to increase the percentage of passing in Mathematics Engineering 1. Therefore, this method is very suitable to be implemented in the process of teaching and learning at Polytechnic Port Dickson as it will encourage students to be more responsible towards their studies. They will also be more confident to solve questions related to the topic of Algebra. The study also found the method of video production using Rapid Educational Video Technique (REVT) method was able to save time and encourage more lecturers to produce educational video.

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