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The Effectiveness of Animated Video-Based M-Learning on Performance, Interest and Motivation among the Economics Students

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ABSTRACT

Economics is an elective subject offered in secondary schools for Form 4 and Form 5 students. However, it is often chosen as a last resort by the students due to its perceived complexity and difficulty to understand. Therefore, this study aims to identify to which extent the Video Animation-Based M-Learning methods impact the performance, interest, and motivation of the students in Economics. The research design used in this study was a quasi-experimental design based on the pre-test and post-test assessments. The sample consisted of 83 secondary school students from two selected schools. The sample was divided into two groups by using random sampling, with 43 students in the experimental group (VAM-L) and 40 students in the control group (CG). The effects of VAM-L and CG on performance, interest, and motivation were analyzed using ANCOVA, while the relationship between performance and interest, and performance and motivation, was analyzed using Pearson correlation. The results of the study showed improvement in performance, interest, and motivation when the VAM-L method was implemented in Economics learning compared to the CG. The findings also indicated a significant difference between performance and interest, but no significant difference was found between performance and motivation. Overall, VAM-L had a positive impact on the students' Economics learning compared to the use of CG. Therefore, these findings are seen as helpful for schools in promoting the use of technology and digital tools in the teaching process.

KEYWORDS- About five key words in alphabetical order, separated by comma Video Animation-Based M-Learning, Performance, Interest, Motivation

1. INTRODUCTION

The in the era of technology and science-based modernization, the use of digital tools is increasingly prevalent in the field of education. This indirectly requires teachers' proficiency in developing and providing more creative teaching methods with a digital concept [1]. The Fourth Industrial Revolution has led many countries to strengthen educational efforts that foster the creation of new knowledge [2]. In line with this, Malaysia is also part of the second wave (2016-2020), which focuses on the use of Information and Communication Technology (ICT) to enhance the quality of learning in Malaysia. This phase also promotes the use of ICT through self-learning and distance learning, as outlined in the Malaysia Education Development Plan (PPPM) [3]. The rapid and widespread development of digital devices has led to the emergence of the m-learning phase, which is a continuation of e-learning [4].

In this context, m-learning is an effective alternative that facilitates smooth learning processes without being restricted to physical locations during the learning process [5]. The implementation of m-learning has empowered teachers to be more creative, particularly in producing various teaching aids with technological concepts, such as the use of video animation through applications like Animaker and Doratoon [6]. However, it is observed through this study that Economics is recognized as a challenging subject by the students and needs to be taken seriously due to its inherent difficulties [7]; [8]. The text structure in Economics involves comparative structures, problem-solving texts, and cause-effect text structures, emphasizing the need for students to read repeatedly to understand the concepts conveyed in a particular topic [9]; [10]. Therefore, video Animation-Based M-Learning methods provide a platform that can help students in improving their performance scores, level of interest, and level of motivation among Economics students.

2. LITERATURE REVIEW

2.1 M-Learning

M-learning is defined as the mobile computer-based learning that utilizes small-sized devices such as computers, smartphones, tablets, and personal digital assistant devices (PDAs) [11]. The adaptation of m-learning among students offers greater flexibility, as it replaces books and notes with smaller devices that contain suitable learning materials for students [12]. The use of m-learning has shown positive effects on students' interest, leading to the improvement in academic achievements [13]; [14]; [15]; [16]. Furthermore, m-learning introduces various features and components that provide highly interactive and user-friendly learning experiences, thereby enhancing students' motivation [17]; [18].

2.2 The Relationship between Interest and Performance

[19] explain that the use of animated texts with visual elements helps to capture students' interest as the displayed images provide clear and easily understandable visual and auditory information, resulting in improved students' achievement. [20] assert that animated content has aided students in obtaining clear visualizations, and the catchy tunes in animated videos possess entertaining qualities that can enhance students' memory skills. Therefore, the use of video animation as a supplementary teaching approach allows teachers to provide concise explanations of the complex topics, ultimately capturing students' interest as well as enhancing their academic performance [21].

2.3 The Relationship between Motivation and Performance

[22] explain that the application of animation concepts in learning sessions has a positive effect on students' perception of inquiry skills. The use of animation concepts demonstrates that students' curiosity has helped enhancing their creative and critical thinking skills as well as problem-solving abilities. [23] argue that the use of engaging characters in animated videos has improved students' skills and built confidence in their communication abilities. Therefore, the utilization of digital animation in videos is seen to make learning more meaningful and satisfying in terms of the learning process and content. Students find it easier to understand, which provides extrinsic motivation and a more positive learning environment [24].

3. RESEARCH METODOLOGY

3.1 Research Design

The research employed a quantitative approach utilizing a quasi-experimental design in the field of educational research. The researcher utilized two instruments, namely a pre-posttest to assess students' performance scores, and a questionnaire to analyze students' levels of interest and motivation. The study sample consisted of two groups: the experimental group and the control group. The grouping was based on the approach used in the study, with the experimental group representing students who follow the Video Animation-Based M-Learning method (VAM-L), while the control group represented students who follow the Conventional method (CG). Both groups underwent a pre-test and a post-test, in which they were exposed to the same teaching method during the pre-test (CG). However, during the post-test, only the experimental group received an eight-week intervention by implementing VAM-L in the Economics subject, while the control group continued with the Conventional method (CG). At the end of the experiment, the researcher conducted an analysis to examine the effects of VAM-L and CG on students' performance, interest, and motivation as measured by the pre-posttest assessments.

3.2 Population and Sample

The population for this study consisted of Form 4 students taking the Economics subject in two secondary schools located in Semporna, Sabah, Malaysia. The sample size involved a total of 83 students, determined based on the recommended sample size from Krejcie & Morgan's (1970) table. The research analysis approach employed quantitative methods obtained from the assessment test scores of students and questionnaires.

3.3 Sampling

3.3.1 Research Instruments

Two types of instruments were used in this study: an assessment test to measure students' performance scores and a questionnaire to assess students' levels of interest and motivation towards the Economics subject. The researcher prepared two sets of assessment tests and questionnaires prior to conducting the study. One set of questions and questionnaires was distributed to all participants to be answered during the pre-test period. Another set was given to the students after the intervention was implemented, during the post-test period.

The constructed assessment test consisted of a single section of multiple-choice questions, comprising 40 closed-ended questions. The questions were based on the current Malaysian Certificate of Education (SPM) format and the Economics syllabus of the KSSM (Kurikulum Standard Sekolah Menengah). On the other hand, the questionnaire was adapted from [25] questionnaire. The questionnaire contained 34 closed- ended questions, and the respondents were instructed to answer all the provided questions completely. The Likert Scale, specifically the Rensis Likert scale (1932), was utilized to determine students' acceptance levels related to the study. The questionnaire consisted of three sections: Section A referred to the students' demographic information, consisting of 4 questions; Section B was related to the students' level of interest, and Section C focused the on students' motivation, with each section contains 15 questions.

3.4 Pilot Research

The pilot research involved a total of 30 students who possessed similar characteristics to the actual sample, but they belonged to different schools. Therefore, all participants in the actual study were excluded from the pilot study. The obtained questionnaire responses from the pilot study were used to assess the instrument's reliability. The analysis of the pilot study revealed a Cronbach's Alpha value of 0.902 for the interest aspect and 0.894 for the motivation aspect. Both Cronbach's Alpha values indicated high consistency and were considered excellent.

3.5 Research Procedure

At the initial stage, the researcher sought permission from the relevant parties to ensure that the study could be conducted in the selected schools. Once approval was obtained, the researcher contacted the subject teachers to discuss the implementation process during the Teaching and Facilitation sessions. These discussions were conducted to ensure that the study would run smoothly without any issues during the pre-test and post-test periods, while also fostering good cooperation from both the teachers and students. Before conducting the study on the actual sample, a pilot study was conducted to establish the validity and reliability of the questionnaire instrument. Following the pilot study, the researcher conducted pre-tests and post-tests on both the experimental and control groups. An intervention was carried out for the experimental group, where students followed the Video Animation-Based Learning method. Finally, the researcher collected all the acquired data for analysis.

4. RESEARCH DATA ANALYSIS

This research utilized Analysis of Covariance (ANCOVA) to measure the level of students' performance, descriptive analysis to compare mean scores for the aspects of interest and motivation, and Pearson correlation to examine the relationship between performance and the aspects of interest and motivation. Additionally, the researcher conducted normality tests to determine whether the obtained data was normally distributed or not. The data analysis results were obtained using SPSS software version 25. The total number of students involved in answering the assessment test and questionnaire was 83, and the analysis results were obtained to address the research questions formulated.

4.1 Research Findings

4.1.1 Difference in Economics Students' Performance Scores before and after Implementing Video Animation-based M-Learning (VAM-L) compared to the Conventional Method (CG)

Based on Table 1, the results of the mean analysis indicate a significant difference for both groups. The researcher found a noticeable improvement in the mean scores when VAM-L was implemented in the Economics subject, with an increase of 8.26. This improvement is evident from the total mean scores in the pre-test (M = 59.81, SD = 13.46) to the total mean scores in the post-test (M = 68.07, SD = 11.20). On the other hand, the mean scores for the Conventional method showed a decline in students' performance, with mean scores in the pre-test (M = 58.30, SD = 14.63) decreasing to mean scores in the post-test (M = 56.50, SD = 12.26). The difference in the change of mean scores for the Conventional method is 1.8, indicating no significant improvement. Overall, the changes in mean scores between the experimental and control groups are distinct, demonstrating that VAM-L has a positive impact on students, enabling them to adapt to this new approach as a tool to better understand the Economics subject.

Table 1
Analysis of Mean Scores and Standard Deviation on Students' Performance using Video Animation-based M-Learning Approach compared to Conventional Method

	Performance	
Learning Method	VAM-L (Experimental Group)	CG (Control Group)

	Pre-Test	Post Test	Pre-Test	Post Test
Min	59.81	68.07	58.30	56.50
Standard Deviation	13.46	11.20	14.63	12.26
N	43	43	40	40

4.1.2 Difference in Economics Students' Interest Levels before and after Implementing Video Animation-based M-Learning compared to the Conventional Method

Based on Table 2, it was found that the interest levels of the experimental group, who followed the Video Animation-Based m-Learning approach, showed a significant change in interest scores (M = 2.28, SD = 1.21) from the pre-test to the post-test period, with interest scores (M = 4.43, SD = 0.51) increasing after the intervention. On the other hand, for the Conventional method, the interest scores remained relatively similar between the pre-test and post-test periods, indicating no significant change. The interest scores in the pre-test (M = 2.21, SD = 1.21) showed a slight change in the post-test (M = 2.69, SD = 1.28).

Table 2
Summary of Comparison of Mean Scores and Standard Deviation on the Aspect of Interest during Pre-test and Post-test Periods for Video Animation-based M-Learning Approach and Conventional Method

Learning Method	Performance			
	VAM-L (Experimental Group)		CG (Control Group)	
	Pre-Test	Post Test	Pre-Test	Post Test
Min	2.28	4.43	2.21	2.69
Standard Deviation	1.21	0.51	1.21	1.28
N	43	43	40	40

4.1.3 Difference in Economics Students' Motivation Levels before and after Implementing Video Animation-based M-Learning compared to the Conventional Method

Based on Table 3, it was found that the motivation levels of the experimental group showed a significant change. The motivation scores in the pre-test (M = 2.37, SD = 1.26) increased to post-test scores (M = 4.38, SD = 0.50) after the intervention. The change in motivation scores increased after the intervention, as the students were directly involved in the video animation-based M-learning approach for a duration of 8 weeks. On the other hand, for the Conventional Method, the motivation scores remained relatively similar between the pre-test and post-test periods. The motivation scores in the pre-test (M = 2.33, SD = 1.26) increased slightly to post-test scores (M = 2.52, SD = 1.28). In the C
onventional method, there was a minor, insignificant improvement in motivation scores, indicating that the control group had less enthusiasm when the teacher continued to use this teaching method for the Economics subject.

Table 3
Summary of Comparison of Mean Scores and Standard Deviation on the Aspect of Motivation during Pre-test and Post-test Periods for Video Animation-based M-Learning Approach and Conventional Method

Learning Method	Perfomance			
	VAM-L (Experimental Group)		CG (Control Group)	
	Pre-Test	Post Test	Pre-Test	Post Test
Min	2.37	4.38	2.33	2.52
Standard Deviation	1.26	0.50	1.26	1.28
N	43	43	40	40

4.2 RESEARCH HYPOTHESES

4.2.1 First Research Hypothesis (H01)

H01: There is no significant difference in the performance scores of Economics students before and after implementing Video Animation-Based M-Learning approach compared to the Conventional method.

Table 4 proves that the null hypothesis (H01) is rejected as the results of the statistical analysis indicate a significant difference in the performance scores of students who followed the Video Animation-Based M-Learning approach compared to those who followed the Conventional method in learning Economics. The obtained analysis is [F (51.86) = 1280.96, $p < .05$], and the recorded variance for both methods implemented in the Economics subject is 87% ($R^2 = .87$). Therefore, it can be observed that the implementation of the Video Animation-Based M-Learning approach has a positive impact on students' learning and aided them in better understanding the subject content more easily.

Table 4
Analysis of Performance Scores for Video Animation-based M-Learning Approach and Conventional Method when implemented in Economics Learning

	Type III Sum Of Squares	Df	Mean Square	F	Significant	Eta Square
Group	1280.96	1.00	1280.96	51.86	.000*	.87

*p< significant at level .05

4.2.2 Second Research Hypothesis (H02)
There is no significant relationship between interest and performance among students who engage in learning through the use of Video Animation-Based M-Learning in the subject of Economics.

Based on Table 5, the obtained significance value is .016 ($p < .05$), which is less than the threshold of .05. Therefore, the H02 hypothesis is rejected as the significant value indicates a relationship between interest and students' performance. In other words, interest influences students' performance, in which an increase or decrease in the interest directly affects their performance. Overall, based on the recorded correlation value, there is a positive relationship between the two variables, and the strength of the relationship is moderate, with a Pearson correlation value of .365.

Table 5
Pearson Correlation Relationship between Interest and Performance of Experimental Group Students (Economics Group II)

		Motivation
Performance	Pearson Correlation	.365
	Significant	.016*

*p significant at level .05

4.2.3 Third Research Hypothesis (H03)
There is no significant relationship between motivation and performance among students who engage in learning through the use of Video Animation-Based M-Learning in the subject of Economics. Based on Table 6, the obtained significance value is .061 ($p > .05$), which is higher than the threshold of .05. Therefore, the H03 hypothesis is failed to be rejected as the significance value indicates no significant relationship between motivation and students' performance. In other words, motivation does not influence the students' performance, proposes that changes in motivation, whether an increase or decrease, do not have an impact on the students' performance. The recorded Pearson correlation value of .288 indicates a weak correlation strength, and the relationship formed is negative.

Table 6
Pearson Correlation Relationship between Motivation and Student Performance in the Experimental Group (Economics Group II)

		Motivation
Performance	Pearson Correlation	.288
	Significant	.061*

*p< significant at level .05

4.3 Study Discussion
The results of the study indicate that the hypotheses were successfully rejected, and the obtained significance

value is ($p < .05$), suggesting the effect of using Video Animation-Based M-Learning compared to the Conventional methods on the students' performance. The findings of this study are supported by the research conducted by [26], which applied instructional animation methods in learning and found that animation medium helps students in understanding the concepts more easily through moving animations and engaging audio, which stimulate students' development during the learning process. [27] also explained that the use of video animation in students' learning can influence attention, cognitive load, and learning performance, thus positively impacting the students' achievement levels.

The analysis results indicate that the Video Animation-Based M-Learning method is effective in increasing students' interest in Economics. This is evidenced by the significant value obtained ($p < .05$) and the rejection of the hypothesis. The interest scores in the questionnaire were also higher compared to the Conventional method applied before the intervention. These findings are consistent with the study conducted by [28] stating that storytelling in animated videos enhances students' learning experience and increases their interest in the taught subject. Moreover, [29] support the use of audio-visual media in the form of animated learning videos in the classroom, as it creates a more engaging learning environment, enabling students to better understand the messages conveyed through the videos.

Lastly, the study found no significant relationship between motivation and students' performance, leading to the failure to reject hypothesis H03 due to the obtained significance value of ($p > .05$). However, the interest scores remained high when implementing the Video Animation-Based M-Learning method in Economics. [30] explained that the low levels of students' motivation may be attributed to the use of homogeneous teaching methods by the teachers. These teaching methods involve minimal student engagement, resulting in passive learning environments where students struggle to showcase their abilities. Therefore, Animation-Based M-Learning teaching methods are seen as beneficial in enhancing students' inquiry skills, curiosity, and critical and creative thinking abilities in problem-solving [22].

5. CONCLUSION

In conclusion, this study highlights the effectiveness of Video Animation-Based m-Learning in the subject of Economics as a supportive teaching method. The use of this approach provides a systematic and time-saving way for teachers to deliver explanations on various subtopics. The study aimed to investigate the impact of this method on the students' performance, interest, and motivation in Economics. The findings indicate a positive effect on students' development of their potential, as they perceive this method as enjoyable due to the use of visual and audio elements that captures their attention. Additionally, the method fosters social interaction among students, bridging the learning gap and enabling them to communicate and share knowledge among their classmates. Therefore, the integration of technology-based approaches enhances the quality of education in line with the aspirations of the Ministry of Education Malaysia (KPM) to maximize student success nationwide and enable them to compete globally.

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