

The Effects of Virtual Text and Graphic Integration Based on Interactive Multimedia Towards Students' Achievement in Summary Writing

Adenan Ayob^a, Noor Syafira Adnan^b, ^{a,b}Sultan Idris Education University,
35900 Tanjung Malim, Perak,

This study was conducted to examine the effect of virtual text and graphic integration based on interactive multimedia in students' achievements in Malay Language summary writing. This study considers students' achievements prior to and following exposure to the virtual integration of text and graphics. This study also identifies significant differences between pre and post- test scores in summary writing. A quasi experimental method was used to measure descriptive and inferential data. A total of 30 form four students were involved as a sample. The results showed a significant difference in mean; that is, $F = 11.2$, significant level < 0.05 . The conclusions from the study show that a virtual text and graphic integration, based on interactive multimedia, improves achievement scores in summary writing. The implication of the study shows that using this virtual integration as a teaching approach can improve Malay students' Language summary writing.

Key words: *Virtual text and graphic integration, Interactive Multimedia, Student's achievement, Malay Language summary writing.*

Introduction

The process of teaching and learning in a classroom today no longer involves a whiteboard. This is not seen as a priority. The growing complexity of the curriculum is more concerned with the reasoning of students to receive the contents of the lesson presented by the teacher. As a result, computer technology, as an interactive vehicle, and multimedia, as material, can function effectively in the classroom (Ministry of Education, 2014). Information and Communication Technology (ICT) is the latest in education. In this context, students interact

continuously with computers in line with the National Education Philosophy (NEF) (Adenan Ayob et al., 2011).

The use of computers as an auxiliary tool represents a turning point and teaching paradigm for writing. In the face of rapid technological innovation, students need to be exposed to greater proactive and innovative learning materials in order to produce a creative and skilful generation in accordance with NEF wishes. Adenan Ayob et al. (2011) state that students should be encouraged to participate in learning sessions that focus on dynamic materials, multiple interactions and to communicate actively in order to focus on effective ideas and views in writing.

Learning and teaching materials in the classroom also need to be used in tandem with information communication technology in order to improve students' achievements in writing. With respect to improving writing, it is recommended that the use of specialised interactive multimedia technology materials should be reviewed from time to time (Adenan Ayob, 2011). Such a study is important to innovating information technology in virtual teaching (Adenan Ayob, 2018). The purpose aims to create a place for students' creativity and critical thinking in learning. Another purpose addresses more specific issues such as students' weaknesses in mastering formula writing skills.

The (Malaysian Examination Board, 2014) prescribes that Form four and five junior high school students need to master writing skills as a complement to knowledge. Furthermore, summary writing is complex in terms of introduction, identification of explicit and implicit content, arrangements of paragraphs and language and conclusion. Outside of writing, compliance with word number instruction should not exceed 120 fractions based on accurate word calculation techniques

When considering the quality of writing in Malay Language 2 of the Malaysian Certificate of Education (SPM), and accredited by the Malaysian Examinations Board (2014), problems in completing the examination are evident. Those students who only answered a few questions represent low performance. The answers provided were not accurate or largely vague, or a combination of both. Students must demonstrate divergent answers to the requirements of the question. Additionally, presentations are found to be less fluent and unorganized and contain many spelling and grammar errors. While teachers understand the meaning of actual answers written by their students, this, nonetheless, causes difficulties for the examiner.

Again, the same examination shows that students' weaknesses in formative writing can be identified when they do not understand the task of writing in advance. Students often use question instructions for implied content as an advance. Therefore, such an advance is inaccurate as it fails to clarify what is contained in the formula. The reality is that recognition of explicit content is based on quoted questions and it is here that students fail to address the desired content. This formulaic approach to writing disregards the role of content.

The Malaysian Examinations Board (2014) Report verifies this by citing examples where students copy the sentence from the passage provided. The identification of implied content is also a problem. Students cannot provide answers that show an understanding of the question(s).

The answer provided is irrelevant and frequently shows a copying of the original sentence in the passage. At the end of the examination, the student cohort sitting the examination failed to provide conclusions required by the question. This is because students do not understand how to construct conclusions based on quotations provided. The answer is deemed irrelevant to the question. Overall, students are weak in terms of using non-grammatical sentences.

Given the Examination Board Report, it can be seen that students' writing is weak. Still many students do not identify the precursors, explicit content, implied content and conclusion in their answers. It is still the case that even with the rapid increases in science and computer technology, teachers still use conventional materials and teaching practices in the classroom. This is because the classroom environment and teaching space do not encourage the use interactive multimedia as a whole (Adenan Ayob, 2018). Students' writing skills do not improve by using inappropriate teaching materials as these materials curb overall student achievement. Adenan Ayob (2014) states that conventional teaching materials based on textbooks, topical training books and lecturer notes are employed in classrooms. This also adds to student disengagement as the topic is unattractive and irrelevant and does not encourage a focus on improving writing.

Technology in language teaching and learning has long been used. According to Adenan Ayob (2011), the use of embedded technologies, such as interactive multimedia, can help teachers and students. This is in line ICT policies informing and guiding Malaysian education. More importantly, this study was conducted because a carefully constructed and informed approach to the integration of text and virtual graphics in summary writing is not in place. This is because the use of text multimedia and virtual graphics materials is not systematically integrated (Bikowski & Vithanage, 2016). Most studies focus more on a single element in interactive multimedia without focusing on its overall integrating pieces (Charles & Natalia D. Jacobsen, 2016). Adenan Ayob (2018) also points out that teachers are still bound by the use of conventional materials in Malay language teaching, which are texts and graphics that are not digital.

For the reasons provided above, this study seeks to explore the effect of virtual text and graphic integration of interactive multimedia on students' achievements in Malay Language summary writing. Quasi experimental methods were used to analyse descriptive and inferential data. The sample covers 30 Form Four students in one secondary school in the district of Larut Matang, Perak, Malaysia.

Research Objective

The study was conducted to:

- i. Identify students' achievement in Malay Language summary writing before and after exposure to virtual text and graphic integration of interactive multimedia and;
- ii. Identify significant differences between pre and post-test mean scores on virtual text and graphic integration based on interactive multimedia.

Research Question

This study proposes the following research questions:

- i. What are the pre and post-test mean scores when virtual text and graphic integration of interactive multimedia is used in the classroom?
- ii. Is there a significant difference between pre and post-test scores when virtual text and graphic integration of interactive multimedia is used?

Significance of Study

This study is important and is expected to benefit students, teachers, schools and ministries of education. The integration of text and graphs for teaching is a contemporary and relevant stimulus for pupils to act and think critically and creatively in solving summary writing learning problems. Students need access to digital and virtual integration to improve their summary writing information skills. A range of text and multimedia graphics can be explored to enhance quality summary writing in the classroom and at examination.

Operational Definitions

Interactive Multimedia

Multimedia has a special meaning. According to Adenan Ayob (2014), interactive multimedia is associated with the use of various types of media or computer systems that combine voice, animation, graphics, text and video. Interactive is defined as allowing continuous two-way information flow between the computer and its users, or between users via the computer (Adenan Ayob, 2018).

Text Integration and Virtual Graphics

Integration of text and virtual graphics is the merging of the two multimedia elements as intermediate material. The merger of these two elements can help students learn and receive more information (Adenan Ayob, 2018).

Pre-test

Pre-test is a performance test carried out by a student before the summative test is performed. Questions are given by the selected sample and results compared with a post administered test.

Post Test

Post-testing is an achievement test undertaken by students after exposure to text integration and virtual graphics. Results obtained from this test are compared with pre-test results.

Summary Writing

An accurate writing formula is challenging to master and problematic for students. It entails a process of identifying the explicit and implied content of the passage, the arrangement of abstinence, the language, the conclusions and conformity to a specified number of words. Together, all of this is a complex process. With regard to the Malaysian Examination Board Scoring Rules (2014), the full scores for summary writing are divided into two: 20 marks and a further 10 marks. Summary writing must comply with the prescribed 120 word limit.

Literature Review

The use of interactive multimedia is closely related to computers. The computer functions as a teaching and learning tool in the classroom that aims to create increased engagement in teaching. Computers can be programmed to help students be more specific and organised in learning. In addition, computers are an electronic tool that can perform tasks such as receiving inputs and processing those inputs to suit the program as well as storing output orders from processing and providing output in the form of information (Gagne, 2005). There are several computer components, including keyboards, monitors, mouse, memory or RAM (Random Access Memory), processors, and compact discs (Adenan Ayob et al., 2011).

The process of teaching and learning in the classroom can be significantly enhanced when computer technology is maximised by instructors. The use of this technology can provide real experience that can stimulate student activity and build on continuous thinking (Mayer, 2001; Adenan Ayob, 2015). The user-friendly features are particularly suitable for students, especially less intelligent students (Adenan Ayob, 2015).

A study on the effects of interactive multimedia has been widely carried out. Truong and Zanzucchi (2012) studies show a mean analysis of an experimental and controlled group and showed a high post-test mean which was 79.2 compared to the mean of the control group, 69.8. This clearly shows the position of post-test achievement for the experimental group as higher to the control group. The study cited here only focuses on graphics and audio integration, whereas text and graphics integration form the basis of the current study.

A study on teacher perceptions about the use of interactive multimedia integration is also relevant to the proposed study. The findings from questionnaires were analysed through descriptive and inferential statistics. The results indicated that teachers' perceptions were significant with a one-sample T Test. From that study, results are aligned with this research and focuses on identifying the effects of achievement through ANCOVA statistics.

Other specialised studies on the impact of elemental integration; text, graphics, audio, and animation in the video contribute to the research field. A study by Nur Ain Mohamed Amin (2013) shows that there are significant differences between pre-test and post-test scores in writing using Android. The use of 'i' technology is done through One-way Anova, which is $F = 2.10$, a significant level < 0.05 . Compared to the research conducted by ANCOVA, the study by Nur Ain Mohamed Amin (2013) relies on different statistics. Differences in statistical use need to be taken into account to prove the significance of an outcome.

Methodology

The methodology used in this study is quasi-experimental. This method suits the selection of non-random samples and keeps group characteristics intact. According to Campbell and Stanley (1979), this design is suitable for viewing group achievement based on pre and post-testing regimes.

Sample and Location of Study

Form Four students in one secondary school in Perak comprise the sample range. The sample was selected because it satisfies intact group criteria. Samples selected were based on school determination. The selected sample had been exposed to the teaching of interactive multimedia materials. The location of the study was situated at one of the national high schools in the district of Larut Matang. The school was chosen because it had sufficient computers and internet access for 30 students for the experiment.

Pre and Post Test Instruments

For this study, a set of pre and post-test questions was prepared. This instrument was selected because it meets the required standard. This is because pre and post-test questions formed part of the Paper II Certificate of Education in Malaysia in 2016.

Validity

For the purposes of this study, pre and post-tests have been automatically validated as both tests are standard. Pre and post-test questions are Paper Question II, Malaysian Education Certificate from 2016. For the implementation of a standardised study, Creswell's view (2014) underpins this investigation.

Data Analysis

The data obtained and analysed is presented in Table 1:

Table 1: Analysis of data.

No.	Research Question	Analysis
i.	What are the pre and post-test mean scores when virtual text and graphic integration of interactive multimedia is used in the classroom?	Descriptive: Mean and Standard Deviation
ii.	Is there a significant difference between pre and post-test scores when virtual text and graphic integration of interactive multimedia is used?	Inferential: ANCOVA

Findings

Respondent Demographics

Table 2 below shows respondents' demographics and relates to the number of pupils:

Table 2: Respondent demographics.

Test	Number of Student
Pre	15
Post	15
Total	30

From Table 2 above, this study involves a group of 30, Form 4 national high school students. A total of 15 students were exposed to the pre-test, while 15 were exposed to only the post-test.

What are the pre and post-test mean scores when virtual text and graphic integration of interactive multimedia is used in the classroom?

Table 3 shows the mean and standard deviation. Mean and standard deviation are presented as follows:

Table 3: Mean and Standard Deviation (SD):

Test	Mean	SD
Pre	75.7	8.4
Post	50.3	11.6

From Table 3 above, the pre-test is 75.7 (SD = 8.4) and the post-test 50.3 (SD = 11.6).

Is there a significant difference between pre and post-test scores when virtual text and graphic integration of interactive multimedia is used?

Table 4: Analysis of Mean Difference:

Test	Degree of Freedom	Mean Square	F	*Sig.
Pre	1	460.5	11.2	0.000
Post	1	45.6		
Error	29	41.0		
Total Corrected	30			

*Significant level < 0.05

Table 4 above shows the value of $F(1, 29) = 11.2$, the significant level is < 0.05. This shows that there is a significant difference in student achievement in pre and post-tests when a pre-test is statistically controlled.

Discussion

The results of this study conclude that there is a significant difference between pre and post-testing. The situation occurs when the pre-test is statistically controlled.

The findings of this study support the relevant research. The study (Adenan Ayob, 2014) suggests that an analysis of mean differences directly proves the integrated use of interactive multimedia in writing can improve students' achievement levels.

The research also supports cognitive findings. Students' achievement in writing increases when teaching and learning programs and resources, along with a comprehensive teaching of writing syntax and grammar, sparks an opportunity to build knowledge (Truong & Zanzucchi, 2012).

This study also supports Bikowski and Vithanage (2016) views that the application of information technology in teaching and learning can increase the credibility of writing scores when engaging virtual-based integration occurs. Truong and Zanzucchi (2012) add that the integration of various elements in interactive multimedia is essential for improving achievement. Integrating elements of interactive multimedia needs to be aligned to instructional design (Larson & Lockee, 2014).

The significant findings of this study are based on active online learning, interaction and communication. The results can help students to communicate competently and interactively with the material. The findings are upheld by a similar study conducted by Charles and Natalia (2016).



The theory of Constructivism supports cognitive research. Such a theory triggers learning processes that build students' minds for writing (McKenney & Reeves, 2012). According to Hasnah Mohamed (2016), an information communication technology concept of constructivism is seen as the formation of knowledge inherent in the rationalisation of experiences through virtual learning. Obviously, the results of this study can be incorporated into mind-mapping an environment of interactive virtual multimedia integration.

Conclusion

The integration of interactive multimedia materials in summary writing represents a way of teaching and learning that is attractive for students. Students can choose the time, space, place and pace in accordance with integration materials and internet access. This freedom allows for new ways of correctly and accurately constructing a writing summary in light of predetermined marking criteria.

Subsequent researchers need to investigate further and ongoing approaches to improving students' achievement in summary writing. Such investigations provide teachers, schools and Ministries of Education the priorities for teaching. Careful and continuous research in this area needs to be conducted from time to time.



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