



Interactive Whiteboards (IWBS): Its Effectiveness in Academic Achievement, Motivation and Interest among Early Year Students

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Abstract

This study aims to see the effectiveness of using interactive whiteboards (IWBS) in English on Year 3 students in early year students. The study's objective is to identify the effectiveness of IWBS on the academic achievement level, motivation level, and interest level among Year 3 students in English subject. A quasi-experimental design was used in this study. Inquiry learning theory and constructivist learning theory were applied in this study. This study lasted for eight weeks and consisted of 39 respondents' various levels of academic achievement randomly distributed into two groups. Data was collected using post-achievement tests and questionnaires for motivation and interest levels. The study's findings show that the interactive multimedia method is more effective in increasing English language academic achievement, motivation, and interest among Year 3 students. Therefore, continuous research on IWBS in English should be carried out to obtain stronger and comprehensive evidence of its effectiveness.

Keywords: IWBS, Interest Level, Motivation Level, Level of Academic Achievement, English

Introduction

The development of technology in the field of education has brought changes to the education system in Malaysia. The use of technology in teaching and learning sessions in the classroom has become a new habit and norm (Herawati et al., 2023; Kaushik & Sugandha, 2022; Manivannan, 2016; Wan et al., 2022). The Ministry of Education (MOE) is trying to provide Information and Communication Technology (ICT) gadgets and internet access in Malaysian schools. The goal is to produce students proficient in ICT during their learning sessions (MOE, Executive Summary Malaysia Education Blueprint 2013-2025 (MOE, Executive Summary Malaysia Education Blueprint 2013-2025 (Preschool to Post-Secondary Education, 2019).

Most educational technology resources are designed to encourage classroom participation. Among various technological tools, IWBS have emerged as a practical alternative to traditional blackboards in primary school classrooms, and it has proven to have advantages for teachers

and students in the process of teaching and learning (Bui, 2023; Goedhart et al., 2019; Handam et al., 2021; Herawati et al., 2023; Wan et al., 2021; Wong et al., 2020). Furthermore, many studies on IWBs have indicated that teaching with the latest technologies can enhance learners' academic achievements and motivation to learn the subject. In today's era, students need to play an active role in the classroom, where teachers act as facilitators. The existing and revised curriculum aims to cultivate the younger generation capable of critical and creative thinking. Additionally, they are trained to master problem-solving skills and effectively address future challenges. Therefore, the development of ICT in education is an inevitable and encouraged element to produce individuals who align with the goals of the Malaysian Education Philosophy. The study by Kaushik and Sugandha (2022) noted that IWBs have been introduced into primary school classrooms in the United Kingdom since the early 2000s to advance student literacy and numeracy. Their statement is in line with Gaol and Hutagalung (2020).

In Malaysia, the importance of ICT in teaching and learning was highlighted when the review and adaptation of the Primary School Standard Curriculum (KSSR) was implemented in 2017. Furthermore, the use of The Common European Framework of Reference for Languages (CEFR) for English began in 2018. It emphasized the importance of mastering English and ensuring that school students could master English more proficiently and effectively. To ensure the success of CEFR, the Ministry of Education (MOE) also encouraged teachers to practice teaching and learning sessions based on the 21st Century Education concept (PAK21) that focuses on ICT in teaching and learning (Yaumi, 2018). Proficiency in using technologies in teaching and learning becomes a vital agenda in schools or MOE.

ICT equipment in the classroom has become a trend in many schools (Bui, 2023; Chirstopoulos et al., 2020; Kaushik & Sugandha, 2022; Wong et al., 2020). The use of hardware like IWBs is believed to adapt to the atmosphere of 21st-century learning in the classroom. The implementation of PAK 21 is one of the focuses of the Ministry of Education (MOE) in the curriculum transformation. The focus of teaching and learning sessions now centers on students, meaning students must proactively explore knowledge (Sulaiman et al., 2020). Teachers only play the role of facilitators and guides throughout the teaching and learning sessions. Students are also encouraged to interact directly with teaching aids, enabling them to master skills and better understand the taught theory.

Problem Statement

The use of ICT in educational approaches is becoming more common. Over the last decade, educators and students worldwide have begun to embrace 21st-century educational practices in which ICT has been integrated into or supplemented classroom lessons. As a result, ICT has been identified as a critical component in the educational transformation detailed in the country's most recent Malaysian Education Blueprint for 2013-2025, indicating its significance in defining the future of national education development. Malaysia is a country consisting of various ethnic groups and cultures. English is the second language commonly used among the people in their daily lives. The purpose of the MOE introducing the CEFR curriculum is to produce a group of students who can maximize their employability opportunities at the global level. However, the performance analysis report for the 2019 UPSR English subject revealed that 13.07% of UPSR candidates received a grade of D, and 14.87% received a grade of E in the English comprehension paper. The English writing paper found that 35.22% of UPSR candidates received a grade of D, and 23.34% received a grade of E. Both

percentages for the English papers indicate that the student's proficiency level is still weak (MOE, 2019).

Moreover, students have low motivation to learn English because they fear making mistakes when using English for speaking and writing. Additionally, the teaching materials cannot pique their interest or encourage them. Teaching and learning sessions that overly focus on English grammar theory cause students to be less interested and unmotivated to learn English. Furthermore, students are also afraid to speak and write in English because their classmates mock them when they make mistakes.

The study conducted by Nurul Atiqah et al. (2021) also indicated that the use of technology to enhance English as a Second Language (ESL) in learning descriptive writing is vital to encourage and motivate students to participate in teaching and learning in English classes, especially in descriptive writing. Furthermore, using technology in teaching and learning could encourage students to learn, especially students who perceive English as less critical than their native language. Moreover, teachers' emphasis on memorizing grammar and English vocabulary causes students to find this subject very difficult to master (Leng Hong, Kim Hua, & Guang Yang, 2020). Consequently, this situation leads to students lacking interest and motivation in the classroom. According to (Tan & Wan, 2019), students lack interest and motivation in learning English, especially in writing, because they lack ideas for writing. This is due to the teaching methods and teaching materials being more teacher-centered and traditional. Students lack motivation and interest because they feel disconnected from the learning process.

Based on the above gaps and the tremendous improvements in global technology, this study aimed to understand the effectiveness of IWBs on the academic achievement, motivation and interest of Year 3 students in sentence writing skills in English.

Objectives and Hypotheses

The research objectives are as follows

- i. To identify the effectiveness of using IWBs on the academic achievement of Year 3 students in sentence writing skills in the English subject.
- ii. To identify the effectiveness of using IWBs on the motivation of Year 3 students in sentence writing skills in the English subject.
- iii. To identify the effectiveness of using IWBs on the interest of Year 3 students in sentence writing skills in the English subject.

The research hypotheses are as follows

Ho1: There is a significant difference in the mean academic achievement of Year 3 students between the control group and the treatment group.

Ho2: There is a significant difference in the mean motivation of Year 3 students between the control group and the treatment group.

Ho3: There is a significant difference in the mean interest of Year 3 students between the control group and the treatment group.

Methodology

This study employs a quasi-experimental method as its research methodology. Quantitative research is used to gather and analyze the effectiveness of using whiteboards in the context of English language learning among Year 3 students. A total of 39 respondents were selected for this study. The study was conducted over 8 weeks. Respondents were drawn from a school in the South Kinta District, Perak. This school was chosen because it has IWBs in its classrooms. Post-tests and questionnaires were used to collect data for this study.

Research Findings

Descriptive analysis was employed in the study. The research objectives were analyzed using the t-test, standard deviation, and mean. Table 1 presents the t-test analysis for the pre-test of the Control Group and Treatment Group.

Table 1

Pre-test t-test Analysis for the Control Group and Treatment Group

Group	N	Mean	Standard Deviation	Differences	t	Df	Sig.(2-ends)
Treatment	19	15.32	5.260	1.406	0.419	37	0.678
Control	20	14.70	3.854				

This study indicates that out of the 39 respondents involved, there is no significant difference ($t = 0.419$, $df = 37$, $p > 0.05$). This means that the English language proficiency level among all 39 respondents in both groups is nearly the same, and there is no substantial difference. It is considered homogenous in academic achievement before the treatment is carried out.

Research Findings for the First Objective

To identify whether there is a significant difference between the control and treatment groups in post-test academic achievement.

Table 2

Post-test t-test Analysis for the Control Group and Treatment Group for Academic Achievement

Group	N	Mean	Standard Deviation	Difference	t	Df	Sig.(2-ends)
Treatment	19	18.10	4.532	1.464	-3.368	37	0.002
Control	20	13.95	3.068				

The results of the t-test analysis obtained in Table 2 indicate that the study's findings are significant ($t = -3.368$, $df = 37$, $p < 0.05$). This analysis reveals a significant difference in post-test scores between the control and treatment groups in English language learning after the study was conducted. The Minimum Score (Min) for the post-test in the treatment group is ($M = 18.10$, $SD = 4.532$), while the Minimum Score (Min) for the post-test in the control group is ($M = 1.95$, $SD = 3.068$), $t = -3.368$, $p = 0.002$. The study's findings indicate that the minimum academic achievement scores in the post-test for the treatment group are higher than those for the control group. This means that interactive multimedia methods are more

effective than traditional methods in teaching English. Therefore, the first hypothesis is accepted, stating a significant difference in English language achievement among Year 3 students taught using IWBs compared to traditional methods.

Research Findings for the Second Objective

To identify whether there is a significant difference between the control and treatment groups in terms of motivation level in the questionnaire.

Table 3

T-test Analysis of Motivation Level Items for the Control Group and Treatment Group for Motivation

Group	N	Mean	Standard Deviation	Difference	t	Df	Sig.(2-ends)
Treatment	19	2.95	0.313	0.136	-2.246	37	0.031
Control	20	2.67	0.449				

Table 3 shows the results of the t-test analysis, and the study's findings are significant ($t = -2.246$, $df = 37$, $p < 0.05$). The research on items related to motivation level indicates that there is a difference between the control group and the treatment group. The minimum score for the treatment group is higher, at ($M = 2.95$), compared to the control group's ($M = 2.67$). Therefore, the second hypothesis is accepted. Overall, the minimum scores in the treatment group are higher than those in the control group. This suggests that the level of motivation among respondents in the treatment group is more favorable than those in the control group.

Research Findings for the Third Objective

To determine whether there is a significant difference between the control and treatment groups regarding interest level in the questionnaire.

Table 4

T-test Analysis of Interest Level Items for the Control Group and Treatment Group for Interest

Group	N	Mean	Standard Deviation	Difference	t	Df	Sig.(2-ends)
Treatment	19	3.04	0.291	0.56	-4.526	32.52	0.000
Group	20	2.48	0.455				

Table 4 displays the results of the t-test analysis, and the study's findings are significant ($t = -4.526$, $df = 32.52$, $p < 0.05$). The research on items related to interest level indicates that there is a difference between the control group and the treatment group. The minimum score for the treatment group is higher, at ($M = 3.04$), compared to the control group's ($M = 2.48$). Therefore, the third hypothesis is accepted. Overall, the minimum scores in the treatment group are higher than those in the control group. This suggests that the level of interest in English teaching and learning sessions among respondents in the treatment group is more favorable than those in the control group.

Discussion

The aim of this study is to revisit existing literature reviews concerning the effectiveness of IWBs in teaching and learning. Currently, these reviews yield diverse results regarding the extent to which IWBs contribute as classroom tools. The goal is to enhance our comprehension of the utilization of IWBs for teaching English subject. The first objective of this study aimed to determine whether there is a difference in the academic achievement of Year 3 students in English sentence writing skills when taught using IWBs compared to students taught using traditional methods.

Based on the data collected and analyzed, the minimum scores for the treatment group (M=18.10) and the control group (M=13.95) indicate a difference in the academic achievement of Year 3 students in the post-test. This suggests that the interactive multimedia method, namely IWBs, positively affects the treatment group respondents compared to the control group respondents who used traditional methods.

The second objective of this study aimed to determine whether there is a difference in the motivation of Year 3 students in English sentence writing skills when taught using IWBs compared to students taught using traditional methods. Data were collected through 18 items in the questionnaire. The minimum scores for the treatment group (M=2.95) and the minimum scores for the control group (M=2.67) indicate a difference in motivation levels between the respondents of both groups. T-test analysis revealed a significant relationship between these two groups. Based on the analysis of minimum scores, respondents from the treatment group using IWBs had higher motivation levels than respondents from the control group using traditional methods.

The third objective of this study aimed to determine whether there is a difference in the interest of Year 3 students in English sentence writing skills when taught using IWBs compared to students taught using traditional methods. Data were collected through 17 items in the questionnaire. The minimum scores for the treatment group (M=3.04) and the minimum scores for the control group (M=2.48) indicate a difference in motivation levels between the respondents of both groups. T-test analysis revealed a significant relationship between these two groups. Based on the analysis of minimum scores, respondents from the treatment group using IWBs had higher interest levels than respondents from the control group using traditional methods.

Implications of the Study

An interactive whiteboard is a tool that facilitates the teaching and learning process. It also encourages student engagement in the learning session. Students are more motivated when teachers use this equipment by providing teaching materials that can actively involve students in the learning session. The effective use of this equipment can enhance student interaction with teaching materials. Studies have shown that this equipment helps respondents improve their level of academic achievement and also found that the interaction between teachers and students, as well as teaching materials, becomes more frequent. This study aims to identify the effectiveness of using IWBs in teaching English among Year 3 students. The study's findings have several implications, with the hope that these implications can benefit both teachers and students.

Based on the findings, it contributes to educational management strategies, where this study can serve as a guide in providing ICT equipment in schools. The Ministry of Education's aspirations may be realized if this equipment is provided in schools and used effectively and

correctly (MOE, Malaysia Education Blueprint 2013-2025, 2019). Using this equipment in the classroom can enhance student academic achievement, interest levels, and motivation. The findings were in line with the previous studies related to the use of technology in teaching and learning (Wong et al. 2019; Truong & Tran, 2020). The second implication is an academic strategy, serving as a guide for educators to conduct future research. Educators interested in conducting studies on this equipment can refer to this study and explore this field in more depth. The research conducted can also serve as a reference for other educators to understand better and use this equipment. The final implication is that teachers must be trained to use this equipment effectively. Teachers can gain a more precise and more accurate understanding of the genuine concept of using IWBs.

Conclusion

Many studies have shown that IWBs positively impact the classroom. Classroom pedagogy has shifted from traditional methods toward 21st teaching and learning with IWBs in the school. Previous research has also demonstrated that classes become more conducive, enjoyable, and challenging when students use this equipment in teaching and learning sessions. This study indicates that this equipment positively affects the respondents' achievement levels, interest, and motivation. The IWB is a tool that provides convenience for both teachers and students. This equipment is suitable for classroom use because it considers students' diverse intelligences. Traditional methods are more challenging for students in the kinesthetic and verbal-linguistic categories. They may struggle to adapt and quickly become bored when traditional methods are used in teaching and learning sessions. This can result in a loss of motivation and interest in learning, indirectly affecting their academic achievement levels. The functions available on the interactive whiteboard assist teachers in teaching more efficiently, reduce the time spent preparing teaching materials, and enable students to learn with enjoyment, all of which can have a positive impact. In conclusion, teachers must be equipped to use IWBs effectively. At the same time, students should be allowed to interact with this equipment extensively in the teaching and learning process. Both parties will benefit from these measures.

Theoretical Contribution

The theories applied in this study are constructivism and inquiry-based learning theories. Both of these theories utilize students' curiosity to explore the English language. Therefore, in the teaching and learning sessions, a conducive classroom environment involving activities that engage students actively can motivate them to complete group assignments.

Furthermore, the theories applied in the study can also enhance students' desire to learn and their willingness to experiment. They are given the freedom to choose problem-solving approaches in group activities. Moreover, they are provided with opportunities to experiment and think critically and creatively in this process. English language teaching and learning sessions can also connect students' prior experiences with new ones, making them more confident and willing to try. Effective use of these tools can realize student-centered teaching pedagogy. Students are prioritized in teaching and learning sessions, allowing them to take the initiative and learn actively. This indirectly allows them to explore their talents. In the learning process, students are given the opportunity to generate ideas and connect knowledge with the real world when they are actively involved in the learning process.

The preparation of teaching materials and daily lesson plans should take into account students' interests and motivation so that they can understand and remain attentive in the

classroom. Full attention also requires motivation from each student to achieve their goals in the learning session. Active student engagement also has a positive impact on the achievement level, as English language achievement improves because the teaching materials used can stimulate students' interest and motivation, giving them the opportunity to actively engage in teaching and learning sessions.

Practical Contribution

This study involves the development of instruments related to the effectiveness of using interactive whiteboards among 3rd-grade students. Therefore, the instruments developed can serve as a reference for other researchers who wish to conduct studies on hardware or ICT-related areas.

The study's findings also indicate that this hardware has a positive impact in terms of improving the level of achievement, interest, and motivation of 3rd-grade students in learning English. Thus, the study's findings can serve as a reference for relevant authorities such as the Ministry of Education, State Education Departments, District Education Offices, and Parent-Teacher Associations to provide this hardware in classrooms. The study's results are expected to be utilized for the benefit of students during teaching and learning sessions.

Teachers whose schools are equipped with this hardware can also refer to the findings of this study to encourage them to use the hardware effectively, making the most of its functions. This is expected to facilitate and reduce the burden on teachers in the preparation of teaching materials.

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