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Influential Factors on Students' Academic Performance: The Impact of PowerPoint Presentations in Primary Public Schools, Sarawak, Malaysia

Sarfraz Aslam¹*, **Lim Mei Yen²**, **Shorouk Aboudahr³**

1 Associate Professor, UNITAR International University
2 Research Assistant, UNITAR International University, Malaysia
3 Lecturer, Faculty of Education and Humanities, UNITAR International University Malaysia *

Abstract

Objectives: In recent years, technology has become increasingly pervasive in classrooms and is integral to effective teaching methods. A teacher can instruct more effectively, and pupils can master and learn the learning objectives and topics more readily. This study aims to investigate and identify the variables that can influence how well students at primary schools in Sarawak use PowerPoint presentations regarding their academic performance. **Methods:** This study used a quantitative research design. A random sample of 150 students from three public schools, SK Bandaran 3, Sibu, SK Sebemban, Spaoh, and SK Ong Tiang Swee, Kuching, Sarawak, were recruited. A self-developed questionnaire was used to collect data. The questionnaire is divided into four parts respondents' demographic data and respondents' feedback on three independent variables the student, instructor, and learning environment factors. Section C is about the dependent variable, which seeks the student's view on the effectiveness of PowerPoint presentations on primary school student's academic achievement. Meanwhile, Section D is about the recommendation from the student's opinion about the best way to achieve the goals of learning the English language. The data were analyzed with SPSS/Win 26.0 software. **Findings:** The results of this study proposed a theoretical framework that predicts the associated factors, including the parent factor, instructor factor, and learning environment factor, that affect the effectiveness of using PPT on University students' academic achievement in teaching the English Language. **Novelty:** This study demonstrated that low and moderate achievers who led using PPT benefited and performed significantly better. Thus, schools should be equipped with IT resources to utilize PowerPoint's potential and raise academic accomplishment fully.

Keywords: ICT; Multimedia; Teaching English; PowerPoint; Academic Achievement

1 Introduction

In educational settings, PowerPoint presentations (PPTP) have revolutionized how information is communicated, ushering in a new era of visual communication. There has been substantial improvement in PowerPoint slide design and delivery over the years, making them more helpful in facilitating learning and enhancing students' academic performance. Despite these advances, the factors influencing PPTP effectiveness on students' academic performance still need to be better understood[1].

In addition to visually appealing graphics and multimedia elements, PPTP can engage students by providing concise textual information. Students' attention, comprehension, and retention of presented material are enhanced when multimedia components, such as images, videos, and animations, are incorporated. Using concise and well-organized textual information, PowerPoint slides can reinforce understanding and promote knowledge acquisition[2]. Additionally, it aids the instructor in fostering a lively and energetic environment among the students. Due to the widespread adoption of technology in many spheres of life, traditional methods of teaching students are now considered old-fashioned.

Yuan et al.[3] assert that novel interactive tactics are more effective than these conventional ones. In the traditional method, the teacher serves as the premier source of information, and students mostly rely on their textbooks. With limited opportunity to contribute or speak for themselves, students' only responsibility is to sit and write down what they have heard.

However, PPTP only partially impact students' academic achievement based on the quality of their visuals or how the information is organized. Other influential factors must be considered. For instance, the instructional approach employed by the presenter, including the level of interactivity and student engagement, plays a crucial role in determining the effectiveness of PPTP. Learners' cognitive characteristics, prior knowledge, and motivation can also significantly impact the outcomes.

This study aims to systematically investigate and analyze the factors affecting students' academic achievement in PPTP to bridge existing gaps and provide insight into these factors. It is possible to develop a comprehensive understanding of PPTP educational potential by exploring how visual design interacts with instructional strategies, learners' characteristics, and contextual factors.

By contributing to the body of knowledge, this study will assist educators and instructional designers in creating and delivering PPTP that are more effective. Ultimately, by addressing the identified gaps, we can harness the full potential of PowerPoint as a pedagogical tool. This will enhance students' academic achievement and create an optimal learning experience.

1.1 Research Questions

1. How did PowerPoint presentations impact primary students' academic achievement?
2. What effect did the instructor factor have on the academic achievement of primary students using PowerPoint presentations?
3. What effect did the learning environment factor have on the academic achievement of primary students using PowerPoint presentations?
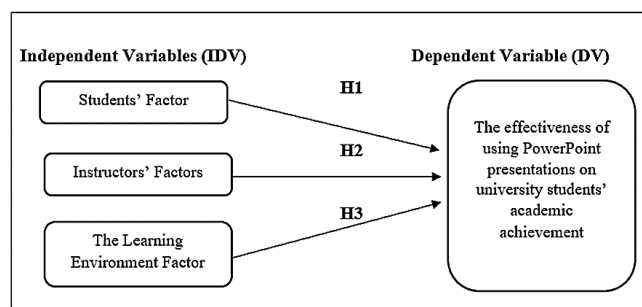
1.2 Research Framework

Fig 1. Theoretical Framework

1.3 Teachers Professional Development

According to Agustini[4], teacher professional development applies to how instructors learn, how they learn to learn, and how they use PowerPoint presentations to help students learn the language. Effective instructors were familiar with their student's learning styles and requirements, as well as their personalities, likes, dislikes, and personal problems that may impact their academic achievement.

1.4 Student's Attention and Motivation

While the adoption of PowerPoint and multimedia in the classroom has expanded dramatically in recent years worldwide[5], little research has looked at the effects on student learning and attitudes.

Students had higher critical perceptions about both the lecturer and the presentation when PowerPoint was being used to offer to teach[1]. Teachers could elicit motivation by utilizing PowerPoint presentations to create academic activities that students would want to engage in because they are interested in the English subject or love the work[6].

1.5 Peer Culture and Achievement

Peer groups influence the intellectual, social, and emotional growth of students. In its most acceptable form, peer groups serve as a healthy coming-of-age transitional stage for students, helping them develop social skills and learn to deal with challenges and problems[7].

This may be seen in how important a child's peer group is to their development and learning; data indicates that teenagers are more at ease and relaxed around their peers. A gifted child will lose interest in learning if uninteresting peers surround them.

1.6 The Effect of PPTP On Student's Academic Achievement

Dolipas et al.[8] looked at the impact of PPTP on academic performance and attitudes among students. In year two, the groups were separated into experimental and control groups, with (32 males) and (32 females) in each. The experimental group was taught utilizing PPP for the first and second groups, as opposed to the control group, who received instruction from the student's book. The results revealed that the groups taught using PPP had higher grades and marks in the first and second years than the control group.

The benefits of utilizing films and PPTP on students' academic progress and knowledge retention were studied by[9]. The control group comprised 35 pupils from the first secondary school, whereas the experimental group comprised 36 pupils from the first secondary school. The first group received instruction using traditional methods such as blackboards and direct lectures. The experimental section's pupils scored higher and were more satisfied than the control group.

Mansour and Odeh[10] investigated the efficacy of PPTP on students' academic performance. His research found that students liked visual content and that seeing pictures and images helped them learn better.

The efficacy of PPT on high school student's academic achievement was explored by Rahman[11]. The study's sample included 54 students who were split into two groups. After the pre-test, the findings show no discernible difference between the two groups. Nevertheless, the final test grade averages show that the experimental group outperformed the 33-control group, and female students scored better than male students.

2 Methodology

2.1 Research Design

The data was collected via an online Google-based questionnaire between January and March 2023 using a cross-sectional survey design[12].

2.2 Participants

The target population location chosen is SK Bandaran 3, Sibu, SK Sebemban, Spaoh, and SK Ong Tiang Swee, Kuching, Sarawak. The population is involved in the school's active students in 2023. A total population of Year 4, 5, and 6 students have been randomly selected to participate as respondents. One hundred fifty respondents were recruited by Simple random sampling, which means that every member of the population has an equal chance of being included in the sample.

2.3 Instrument

A self-developed questionnaire from previous literature was used to collect the data for this study. The questionnaire is divided into four parts; Section A is about the respondents' demographic data, and Section B seeks respondents' feedback on three independent variables, which are questioned about the student, instructor, and learning environment factors. Each of the variables consists of 5 items. The respondents are required to answer all the questions. In contrast, Section C is about the dependent variable, which seeks the student's view on the effectiveness of PowerPoint presentations on primary school students' academic achievement and consists of 5 items. Meanwhile, Section D is about the recommendation from the student's opinion about the best way to achieve the goals of learning the English language.

Respondents were asked to rate their agreement or disagreement using a five-point Likert scale during the survey. Cronbach's alpha was used to determine the internal consistency of items. Cronbach's values for the benefits of RL were 0.84, while those for the challenges were 0.83. As a rule, reliability coefficients between +0.3 and 0.69 indicate moderate levels of reliability, while coefficients between +0.7 and 1 indicate strong levels[13].

2.4 Data Collection and Analysis

The data collection used in this research is the survey through Google Forms. The questionnaire is uploaded through Google Forms. Afterward, the Google Form link was shared with respondents through the WhatsApp application to different study groups. Google Forms data were exported for statistical analysis using IBM SPSS version 26 to generate the research's rate, percentage and mean, standard deviation, reliability test, and correlation analysis. The first type of data analysis is descriptive analysis, where it is analyzed and describes a summary of the respondents' demographic in terms of frequency and percentages of data collection. Descriptive analysis, which calculates the mean and standard deviation for each item in the independent and dependent variables, is the second form of data analysis.

This study adheres to all ethical norms. Participants agreed to participate in the study by signing the consent form on page one of the online questionnaire. Survey participants volunteered to participate. Before the survey, the respondents were informed that the data would remain confidential. The participants were not asked to provide any personally identifiable information.

3 Results and Discussion

3.1 Demographic Statistics

A total of 150 students participated in this study. Among them, 114 (36%) of them were female students. Out of 150 respondents, 18 (12%) are Malay, and 60 (40%) are Chinese. 114 (76%) respondents were 12 years old, and 27 (18%) respondents were 11 years old. Most respondents, 120 (80%), were currently in Year 6 of the study.

3.2 Overall Descriptive Statistics

Based on the result (Table 1), the instructor factor obtained the highest mean value, 4.29, followed by the student factor, which received a 4.19, and the lowest in the learning environment factor, with a 3.93. Therefore, most respondents agreed that the instructor factor is the factor that most affects the effectiveness of using PowerPoint presentations on students' academic achievement at SK Bandaran 3, Sibu, SK Sebemban, Spaoh, and SK Ong Tiang Swee, Kuching in Sarawak. Wendy Russell has proved this: "In both a student-directed and a teacher-directed environment, PowerPoint is a fantastic tool for learning." (2007: 76). Text, pictures, sound, video, and other items may be included in slides, and they can be organized in any way to help students improve their academic achievement. Meanwhile, the learning environment factor is voted the least important by respondents because poor sanitation, lack of facilities, lack of accommodation, lack of safety and security, and other factors create fear and discomfort in students, which can lead to poor learning and academic achievement.

Table 1. Overall Descriptive Statistics

Independent Variable	Mean	Std. Deviation
Student Factor	4.19	.755
Instructor Factor	4.29	.842
Learning Environment Factor	3.93	.875

3.3 The Student Factor

The highest mean is 4.48 (Table 2) with a standard deviation of 0.762, where the statement that most respondents agree with is F1-"Students learned better." This means the students learned better if the course material was presented through some visual tools. According to the research given, the teachers believed that the PowerPoint made the content more appealing; therefore, they helped them to take student attention[14].

The neutral statement is F4-"Ease of Use for Students and Teachers." There are many presentations software available. But none of them compares to the ease of using PowerPoint offers. It is suitable for teachers who are not techno-friendly and students. Using it is very simple and easy. It can add fonts, formatting, and animation with a button (14 Effects of PowerPoint Presentations, n.d.). However, the lowest mean is 3.74 with a standard deviation of 1.25, where the respondents disagree with the statement F5-"The Learning curve for the technology is often perceived to be too steep.".

This is because there is always reluctance, particularly among the older and less technology-oriented staff, to adopt the new technology. Experience from running staff development sessions aimed at developing appropriate PPT skills, using both hands-on and seminar formats, suggests that it is a straightforward process compared to learning to use some of the other commonly used software frequently found on modern computer software[15].

Table 2. The Student Factor

Code / Items	Mean	Std. Deviation
F1. Students learned better	4.48	.762
F2. Extremely efficient tool	4.48	.788
F3. Multiple uses	4.02	1.02
F4. Develops confidence in students.	4.24	.870
F5. The Learning curve for the technology is often perceived to be too steep	3.74	1.25

3.4 Instructor Factor

For the instructor factor (Table 3), the highest mean is 4.32, with a standard deviation of 0.84370. The most agreed statement is about G1-"My teacher uses PowerPoint presentations to help accommodate my learning styles (e.g., Visual Learner, Aural Learner, Verbal Learner)" by most respondents. Hence, becoming familiar with technology such as PowerPoint presentations opens up many pedagogical possibilities[8].

Over and above that,[16] findings are consistent with a large body of studies demonstrating that learning could be aided by presenting visual and verbal learning material in a specific way and that multimedia presentations are beneficial and advantageous for certain types of students, motivation for future success is increased when a student's learning requirements are satisfied.

The statement that the mean ranked in the middle is 4.28 with a standard deviation of 0.858 is G3-"My teacher uses PowerPoint presentations to motivate me to get more involved in learning activities." Because[17] argues that teachers who exhibit personal interaction with learners show those learners that they are valued, so the respondents felt neutral.[18] backed this up, stating that emotions of respect inspire and engage pupils, resulting in improved positive production and academic performance.[6] say that high levels of teacher passion and excitement for learning increase student motivation and accomplishment. The connection between student motivation and achievement is evident.

Additionally, the lowest mean is 4.26 with a standard deviation of 0.899, where the respondents less agree that G2-"My teacher uses PowerPoint presentations to promote my collaboration." This is because promoting student cooperation through PowerPoint presentations is challenging. According to[19], using PPT makes collaboration between instructors and students more difficult. Instead, conventional classrooms allow them to discuss ideas more freely. He then goes on to argue that traditional classroom lectures are preferable.

3.5 Correlation Analysis

- **Research Question:** What effect did the parental factor have on the academic achievement of primary students using PowerPoing presentations?
- **Null hypothesis, H_{01} :** There is no significant relationship between the parental factor and the effectiveness of PowerPoint presentations on primary school student's academic achievement in teaching the English language.

Table 3. The Instructor Factor

Code / Items	Mean	Std. Deviation
G1. My teacher uses PowerPoint presentations to help accommodate my learning style. (E. g., Visual Learner, Aural Learner, Verbal Learner)	4.32	.843
G2. My teacher uses PowerPoint presentations to promote my collaboration.	4.26	.899
G3. My teacher uses PowerPoint presentations to support me in learning the English language process.	4.28	1.01
G4. My teacher uses PowerPoint presentations to motivate me to get more involved in learning activities.	4.2800	.858
G5. My teacher uses PowerPoint presentations to improve the learning of critical concepts and ideas.	4.3200	.913

The result of the Correlation Analysis showed that the Pearson Correlation Coefficient is 0.793 and the p-value is 0.000, which is less than 0.01. This means that the decision is to reject the null hypothesis. Therefore, there is a significant relationship between the parental factor and the effectiveness of PowerPoint presentations on primary school students' academic achievement in teaching the English language.

Table 4. Correlation Analysis between The Parental Factor and The Effectiveness of Using PPT On Primary School Students' Academic Achievement in Teaching the English Language

Category		IV_1	DV
	Pearson Correlation	1	.793**
The Parental Factor	Sig. (2-tailed)		.000
	N	50	50
The effectiveness of using PowerPoint presentations on primary school student's academic achievement in teaching the English language	Pearson Correlation	.793**	1
	Sig. (2-tailed)	.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

- **Research Question:** What effect did the instructor factor have on the academic achievement of primary students using PowerPoing presentations?
- **Null hypothesis, H$_{02}$:** There is no significant relationship between instructor factors and the effectiveness of PowerPoint presentations on primary school students' academic achievement in teaching the English language.

The Correlation Analysis result showed that the Pearson Correlation Coefficient is 0.769 and the p-value is 0.000, less than 0.01. This means that the decision is to reject the null hypothesis. Therefore, there is a significant relationship between the instructor factor and the effectiveness of PowerPoint presentations on primary school students' academic achievement in teaching the English language.

Table 5. Correlation Analysis between The Instructor Factor and The Effectiveness of Using PPT On Primary School Students' Academic Achievement in Teaching the English Language

Category		IV_2	DV
	Pearson Correlation	1	.769**
Instructor Factor	Sig. (2-tailed)		.000
	N	50	50
The effectiveness of using PowerPoint presentation on primary school student's academic achievement in teaching the English language	Pearson Correlation	.769**	1
	Sig. (2-tailed)	.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

- **Research Question:** What effect did the learning environment factor have on the academic achievement of primary students using PowerPoint presentations?
- **Null hypothesis, H$_{03}$:** There is no significant relationship between the learning environment factor and the effectiveness of PowerPoint presentations on primary school students' academic achievement in teaching the English language.

The result of the Correlation Analysis showed that the Pearson Correlation Coefficient is 0.787 and the p-value is 0.000, which is less than 0.01. This means that the decision is to reject the null hypothesis. Therefore, there is a significant relationship between the learning environment factor and the effectiveness of PowerPoint presentations on primary school student's academic achievement in teaching the English language.

Table 6. Correlation Analysis between The Environmental Factor and The Effectiveness of Using PPT On Primary School Students' Academic Achievement in Teaching the English Language

Category		IV_3	DV
The Learning Environment Factor	Pearson Correlation	1	.787**
	Sig. (2-tailed)		.000
	N	50	50
The effectiveness of using PowerPoint presentations on primary school student's academic achievement in teaching the English language	Pearson Correlation	.787**	1
	Sig. (2-tailed)	.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

This study aims to determine the variables that influence how well PPT at SK Bandaran 3 in Sibu, Sarawak, is used to teach English to primary school pupils in terms of academic accomplishment. There are 150 students chosen randomly to participate in an online survey using Google Forms from among the students enrolled in different classes at SK Bandaran 3 in Sibu, Sarawak, in January 2023. These students are in Years 4, 5, and 6. The findings from the SPSS Statistic Version 26 study supported the respondents' perceptions of the variables influencing the impact of PowerPoint presentations on primary school pupils' academic progress in teaching the English language as being the parental factor, Teacher Factor, and Learning Environment Factor.

The findings showed that the instructor factor contributed the most significant factor affecting the effectiveness of using PowerPoint presentations on primary school students' academic achievement in teaching the English language at SK Bandaran 3, Sibu, Sarawak. From the result that has been obtained, the most agreed statement is about G1-"My teacher uses PowerPoint presentations to help accommodate my learning styles (e.g., Visual Learner, Aural Learner, Verbal Learner)" by most of the respondents. Therefore, this means the instructor's characteristics toward the effectiveness of using PowerPoint presentations is an essential element that will affect primary school students' academic achievement in teaching English. This is supported by [10] stating that when utilizing PowerPoint presentations in the classroom, instructors must ensure that verbal and visual signals are comparable to enhance student learning and retention. According to [20], understanding students' learning style preferences may help instructors develop successful learning techniques.

The results demonstrated that all the variables had a significant positive link and strong correlation to the impact of PowerPoint presentations on primary school pupils' academic accomplishment while teaching the English language. The results demonstrated that hypothesis H01 is supported and that parental characteristics positively correlate with the success of using PowerPoint presentations to teach English to primary school pupils in terms of academic accomplishment. This is supported by [21], who noticed that children with parents who create a nurturing environment through communication have greater self-esteem and are more goal-oriented. Promoting the value and importance of education is an integral part of parental communication. According to studies, children are more engaged, motivated, and confident in their academic success when their parents express that they respect education and have high expectations.

Second, the findings showed that hypothesis H$_{02}$ is supported; the instructor factor has a positive relationship with the effectiveness of PowerPoint presentations on primary school student's academic achievement in teaching the English language. This is supported by [8] discussing technological advancements, such as PowerPoint presentations, on students and instructors. According to [8], PowerPoint is used by instructors to help with notetaking, making lectures more entertaining and engaging, material presentation, and information clarity. The instructor can write down essential concepts, combine visuals and photos, audio and video, and deliver things legibly using PowerPoint presentations.

The results unequivocally demonstrated that hypothesis H03 is supported and that the learning environment factor has a favorable relationship with the effectiveness of PowerPoint presentations on primary school student's academic achievement

in teaching the English language. The learning environment in the classroom supports this. Factors at the school level, such as the principal's leadership style, the school's culture, and the professionalism and social standards of the teachers, will impact students' academic success[22,23]. When it comes to teacher development or teacher training, more attention should be paid to leadership and management style in the classroom so that educators can develop the abilities to lead students and foster a healthy learning environment since the teachers have such a significant influence on the psychological climate of the classroom. The classroom environment can interact with students' traits and impact their learning attitude and behavior[5]. Several academics and practitioners have looked at this relationship to improve learning outcomes and results in the classroom[24]

4 Conclusion

Based on the results of this study, three factors determine whether PowerPoint presentations are effective in teaching the English language to primary school students: the parent factor, the teacher factor, and the learning environment factor. Through further investigation of these three factors through experimental studies, future English educators can continue to improve their ability to teach with PowerPoint. In order to facilitate quick and effortless use of PowerPoint presentations in English lessons, the Ministry of Education should continue with the current curriculum. Moreover, additional research regarding how the factor affects the effectiveness of PowerPoint presentations in teaching the English language to primary school students should be conducted at the level of other educational institutions. All English educators must be aware of these issues and can contribute to adapting and enhancing the effectiveness of PowerPoint presentations when teaching English.

5 Acknowledgement

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