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UTILIZING BLAND AND INTERACTIVE POWERPOINT DURING MATHEMATICS CLASS: PHYSICAL EDUCATION STUDENTS' PERCEPTIONS

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Abstract

PowerPoint is a widely used presentation software capable of displaying multimedia elements such as images, videos, audio, and text through visually engaging and creative slide shows. This study explored the perceptions of Physical Education students regarding the use of bland and interactive PowerPoint during their Mathematics classes. Specifically, it aimed to determine whether students' perceptions varied in terms of active participation, motivation, and learning when exposed to these two types of PowerPoint presentations. The study involved 36 first-year Bachelor of Physical Education students at a university in Pampanga, Philippines, comprising 22 females and 14 males. Using a closed-ended questionnaire, quantitative data were collected and analyzed. The findings revealed a significant difference in students' perceptions, with more students strongly agreeing that interactive PowerPoint (iPPT) significantly enhanced their active participation, motivation, and learning compared to bland PowerPoint (bPPT). It was concluded that the use of iPPT in teaching Mathematics provided greater support to students, particularly by fostering higher levels of engagement, motivation, and improved learning outcomes.

Keywords: Bland PowerPoint, Interactive PowerPoint, Motivation, Students' active participation, Students' perception.

Abstrak

PowerPoint adalah perangkat lunak presentasi yang banyak digunakan yang mampu menampilkan elemen multimedia seperti gambar, video, audio, dan teks melalui tayangan slide yang menarik secara visual dan kreatif. Penelitian ini mengeksplorasi persepsi mahasiswa Pendidikan Jasmani terkait penggunaan PowerPoint monoton dan interaktif selama pelajaran Matematika mereka. Secara khusus, penelitian ini bertujuan untuk mengetahui apakah persepsi mahasiswa berbeda terkait partisipasi aktif, motivasi, dan pembelajaran ketika terpapar dengan kedua jenis presentasi PowerPoint ini. Penelitian ini melibatkan 36 mahasiswa tahun pertama program Sarjana Pendidikan Jasmani di sebuah universitas di Pampanga, yang terdiri dari 22 perempuan dan 14 laki-laki. Dengan menggunakan kuesioner tertutup, data kuantitatif dikumpulkan dan dianalisis. Hasil penelitian menunjukkan perbedaan signifikan dalam persepsi mahasiswa, dengan lebih banyak mahasiswa yang sangat setuju bahwa PowerPoint interaktif secara signifikan meningkatkan partisipasi aktif, motivasi, dan pembelajaran mereka dibandingkan dengan PowerPoint yang monoton. Disimpulkan bahwa penggunaan PowerPoint interaktif dalam pengajaran Matematika memberikan dukungan lebih besar kepada mahasiswa, terutama dengan meningkatkan tingkat keterlibatan, motivasi, dan hasil pembelajaran yang lebih baik.

Kata kunci: Motivasi, Partisipasi aktif siswa, Persepsi siswa, PowerPoint interaktif, PowerPoint monoton.

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INTRODUCTION

The COVID-19 pandemic has profoundly disrupted education systems worldwide, presenting unprecedented challenges for students, educators, and administrators. As schools, colleges, and universities closed to curb the spread of the virus, millions of students were forced to shift to remote and online learning models, which fundamentally altered traditional educational practices. In line with this, educational technologies and learning media are being utilized to deliver instruction and course content.

Before the pandemic, technology was a tool that the teachers used to enhance their teaching strategy, it became the medium and substance of education itself. Hence, educators are required to update their competencies, respectively (Dias, 2021).

Presently, one of the most widely used instructive technologies is the Microsoft PowerPoint Presentation (PPT). A PowerPoint presentation is made up of a series of slides, which contain the information you want to communicate with the audience. This information can include text, pictures, charts, video, sound, and more (Heights Libraries, 2021; Osman et al., 2022).

PowerPoint can effectively present material in the classroom and encourage student learning (Northern Illinois University, 2020). It also aids in creating auditory, visual, and audio-visual effects in the classroom during teaching which is quite useful in grabbing and maintaining students' attention and activeness. Moreover, PowerPoint lectures were judged to be more ordered as slides emphasize the most significant information by summarizing and simplifying the content (Baker et al., 2018).

Additionally, a PowerPoint presentation can be a powerful tool to make learning more engaging, spark discussions, and support progress. To achieve this, we need to get creative and move away from the usual approach of just showing slides and reading from them. Instead, we should explore interactive and dynamic ways to use it, making the experience more engaging and meaningful for everyone involved (Romkema & Phillips, 2020).

Naidoo and Hajaree (2021) highlighted that integrating videos into PowerPoint makes learning mathematical concepts like fractions more engaging. Similarly, Anwar et al. (2020) found that interactive, video-based PowerPoint significantly improved Grade VII students' knowledge and performance. However, drawbacks limit PowerPoint's potential. Ratu and Komara (2021) noted that overly text-heavy slides and unappealing

visuals can lead to student boredom and disengagement. Additionally, Fisk (2019) emphasized that while PowerPoint is easy to use, many educators mistake ease of creation for effective presentation, resulting in poor-quality slides without proper training or thoughtful design. Thus, the PPT's effectiveness partially depends on the instructor's teaching style. According to Albinagorta (2019), poorly designed slides can result in a loss of audience attention and engagement and undermine the presenter's credibility.

The quality of PowerPoint presentations largely depends on the creators. While it has become a standard tool for traditional presentations, it must be designed creatively and thoughtfully to enhance students' learning experiences. With the rise of online classes in Higher Educational Institutions (HEIs), reliance on software like Microsoft PowerPoint has grown significantly.

Existing studies have shown the benefits of using iPPT in mathematics (e.g Anwar et al., 2020; Naidoo & Hajaree, 2021). However, there is a lack of research focusing specifically on its application in higher education, particularly in subjects like Physical Education intertwined with Mathematics. To address this, the researchers developed an iPPT presentation to improve Physical Education students' perceptions of learning, motivation, and activeness in their Mathematics classes.

Generally, the study aimed at determining Physical Education students' perception about using bPPT and iPPT during their Mathematics class. Specifically, it answered the following questions: (1) How may the perception of Physical Education students be described in terms of the utilization of bPPT?, (2) How may the perception of Physical Education students be described in terms of the utilization of iPPT?, (3) Is there a significant difference between the perceptions of Physical Education students towards the utilization of bPPT and iPPT?, (4) Is there a significant difference between students' activeness?, (5) Is there a significant difference between students' motivation?, and (6) Is there a significant difference between students' learning?

RESEARCH METHODS

The study used a descriptive-correlational research design. According to Sousa et al. (2007), this design describes relationships between the variables. It was utilized to find a significant difference in the perception of the Bachelor of Physical Education regarding the utilization of bPPT presentations and iPPT presentations.

Instrument

The study utilized thirteen (13) closed-ended survey questions adapted and modified from various authors. The questionnaire is a Likert Scale 5 to 1 format of Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD) to quantitatively assess the students' perceptions towards the utilization of bPPT and iPPT presentations. The questionnaire was compiled based on the dependent variables namely; students' active participation, motivation, and learning. Herewith, the participants were asked to put a checkmark (✓) on the column corresponding to their response.

Specifically, questions number 1, 2, 3, 4, 5, and 13 were from the study of Ratu and Komara (2021) entitled "An Analysis of EFL Students' Perception of PowerPoint Used as English Learning Media in Classroom." Questions number 6, 7, and 11 were from Smith's (2015) study entitled "The Perceptions of Students about PowerPoint as a Teaching Tool in College-Level." Then, question number 8 originated from Obaidullah and Islam's (2019) study entitled "Students' Perceptions towards PowerPoint in Language Classroom: Voices from the Inside". Lastly, questions number 9, 10, and 12 were from Abdellatif's (2015) study entitled "Exploring Students' Perceptions of using PowerPoint in Enhancing Their Active Participation in the EFL Classroom Action Research Study."

Participants

The research participants were the first-year Bachelor of Physical Education students at one of the University at Philippines. The study included all students in the observed classroom, utilizing a total enumeration sampling technique. A total of 36 students participated, comprising 22 females and 14 males.

Procedure

A letter of permission was sent to various authors for approval to adapt their survey questions. Once approval was received, the researchers combined, modified, and adapted the questions to assess students' perceptions of active participation, motivation, and learning when PowerPoint presentations were used in classroom discussions. A total of 13 closed-ended questions were included.

The questionnaire was created using Google Forms, with a letter of consent included to ensure the privacy of respondents' information. The researchers then coordinated with a cooperating teacher to administer the first survey to one of his sections. The pre-survey aimed to gather participants' perceptions of the bPPT they were using during their reporting. The Google Form link was shared via a Messenger group chat, and participants began answering the survey.

The researchers then created and prepared a sample of the iPPT, which included an interactive game for motivation, eye-catching slides, and designs, pictures, and graphics. This iPPT was used during the demo-teaching session conducted by the three researchers. To complete the data gathering process, a post-survey was administered to gather students' perceptions of the iPPT. The data were collected, tallied, and recorded for statistical analysis and interpretation. The following tools were used: First, the Frequency and Percentage Distribution Formula to summarize the data and identify the levels of active participation, motivation, and learning of the respondents concerning the use of bPPT and iPPT. The Mean was also used to determine the overall perception of the respondents. Additionally, a Two-Sample *t*-test was applied to assess if there was a significant difference between students' perceptions of bPPT and iPPT presentations.

To interpret the perceptions on bPPT and iPPT of the students, the following scale was used: Strongly Disagree (SDA, 1.00 – 1.49), Disagree (DA, 1.50 – 2.49), Neutral (N, 2.50 – 3.49), Agree (A, 3.50 – 4.49), and Strongly Agree (SA, 4.50 – 5.00).

RESULT AND DISCUSSION

Table 1 shows the perception of the learners towards bPPT. It can be seen in Table 1 that the statement “I asked more questions to the teacher during class learning when the PowerPoint is used” obtained the lowest mean of 4.14 which was descriptively interpreted as “agree.” While the statements “I feel more interested in learning when my teacher uses PowerPoint in class” and “I learn better when the teacher uses PowerPoint” obtained the highest mean of 4.50 which was interpreted as “strongly agree.” Then, the overall mean is equal to 4.37 which was interpreted as “agree.” This means that the respondents agreed that utilizing bPPT increased students’ active participation, motivation, and enhanced learning.

Table 1. Students' perception towards bPPT

Statements	Mean	Remarks
a. I feel excited when my teacher is teaching the material using PowerPoint	4.28	A
b. I feel more interested in learning when my teacher uses PowerPoint in class	4.50	SA
c. I feel motivated to learn when my teacher teaches using PowerPoint	4.44	A
d. I feel my interactions are very strong when my teacher uses PowerPoint in class	4.36	A
e. I'm curious about the learning material (PowerPoint) in the class	4.25	A
f. I feel that the PowerPoint effectively captures my attention	4.47	A
g. I feel that PowerPoint increases my activeness when learning Mathematics	4.47	A
h. I feel that the PowerPoint presentation activates my thinking process	4.28	A
i. I feel that the PowerPoint helps me to concentrate on the lesson	4.42	A
j. I have more chances to participate when PowerPoint is used	4.31	A
k. I feel that the PowerPoint used during lectures is the most effective form of communicating course content	4.39	A
l. I learn better when the teacher uses PowerPoint	4.50	SA
m. I asked more questions to the teacher during class learning when the PowerPoint is used	4.14	A
Grand Mean	4.37	A

In the study by Ghimire and Joshi (2023), students appreciated the use of PowerPoint as an effective aid in learning, particularly for enhancing memory retention, even though most teachers did not fully utilize the 6x6 design. This underscores PowerPoint's potential as a valuable teaching tool while highlighting the need for improvement in its implementation.

Table 2 indicates the students' perception of the students towards iPPT. The statement "I asked more questions to the teacher during class learning when the PowerPoint is used" obtained the lowest mean of 4.61 among others. Nevertheless, its descriptive rating is still "strongly agree." On the other hand, the statement "I feel more interested in learning when my teacher uses PowerPoint in class" has the highest mean of 4.89. Herewith, the overall mean is equal to 4.77. Generally, all the statements had a descriptive rating of "strongly agree" which indicates that respondents strongly agreed that utilizing iPPT increased students' perception in terms of active participation, motivation, and learning.

Table 2. Students' perception towards iPPT

Statements	Mean	Remarks
a. I feel excited when my teacher is teaching the material using PowerPoint	4.81	SA
b. I feel more interested in learning when my teacher uses PowerPoint in class	4.89	SA
c. I feel motivated to learn when my teacher teaches using PowerPoint	4.81	SA
d. I feel my interactions are very strong when my teacher uses PowerPoint in class	4.75	SA
e. I'm curious about the learning material (PowerPoint) in the class	4.64	SA
f. I feel that the PowerPoint effectively captures my attention	4.83	SA
g. I feel that PowerPoint increases my activeness when learning Mathematics	4.81	SA
h. I feel that the PowerPoint presentation activates my thinking process	4.75	SA
i. I feel that the PowerPoint helps me to concentrate on the lesson	4.75	SA
j. I have more chances to participate when PowerPoint is used	4.81	SA
k. I feel that the PowerPoint used during lectures is the most effective form of communicating course content	4.75	SA
l. I learn better when the teacher uses PowerPoint	4.81	SA
m. I asked more questions to the teacher during class learning when the PowerPoint was used	4.61	SA
Grand Mean	4.77	SA

These findings are consistent with those of Ledy and Syafryadin (2023) when students interact with PowerPoint often, they feel more engaged, inspired, and motivated to study. Similar results also show in the study of Domosmog and Ibojo (2024) that the PowerPoint presentation is more effective in enhancing the academic performance of students.

Table 3. Statistical difference in students' perceptions of bPPT vs. iPPT

Test Statistic	bPPT	iPPT
Mean	4.370	4.769
Variance	0.378	0.199
N	36	36
Pooled Variance	0.289	
Hypothesized Mean Difference	0	
df	70	
$t_{calc.}$	-3.154	
p-value (two-tail)	0.002	
$t_{critic.}$	1.994	

As shown in Table 3, the mean score of students' perceptions towards the utilization of bPPT was 4.370, with and variance of 0.378, while the mean score of students'

perceptions towards the utilization of iPPT was 4.769 and variance of 0.199 with both 36 observations. The result of the pooled variance was 0.289 with degrees of freedom of 70. The result of the actual *t*-test was equal to -3.154.

In Table 3, *p*-value=0.002 gives us the probability that a value of $t_{calc.}$= -3.154, if in an absolute value is larger than $t_{critic.}$=1.995. Since the *p*-value is larger than α=0.05, thus there is a significant difference in the means of the two samples.

For instance, in the study of Shatri and Shala (2022) shown that the use of interactive digital presentations has a positive effect on the memorization of concepts and students' engagement and that this kind of presentations are more efficient to use.

Table 4. Statistical difference in students' perceptions of bPPT vs. iPPT on activeness

Test Statistic	bPPT	iPPT
Mean	4.333	4.741
Variance	0.375	0.223
N	36	36
Pooled Variance	0.299	
Hypothesized Mean Difference	0	
df	70	
$t_{calc.}$	-3.162	
p-value (two-tail)	0.002	
$t_{critic.}$	1.994	

As seen in Table 4, the mean score of students' activeness, when bPPT was utilized, is equal to 4.333 and its variance is 0.375. Then, the mean score and variance of students' activeness when iPPT was utilized were 4.741 and 0.223 respectively.

In Table 4, *p*-value=0.002 gives us the probability that a value of $t_{calc.}$= -3.162, if in an absolute value is larger than $t_{critic.}$=1.994. Since the *p*-value is larger than α=0.05, thus there is a significant difference between students' activeness.

In the study of Kassa et al. (2024) multimedia addresses the needs of diversified classroom learners, simplifies complex and creates a more active learning environment. Furthermore, research by Dewi et al. (2024) supports the idea that using PowerPoint increases student participation, which improves attentiveness, idea expression, task completion, and engagement which is crucial for enhancing learning outcomes.

As reflected in Table 5, the mean score of students' motivation when bPPT was utilized is equal to 4.407 and its variance is 0.465. Following, the mean score and variance of students' motivation when iPPT was utilized were 4.833 and 0.175 respectively.

Table 5. Statistical difference in students' perceptions of bPPT vs. iPPT on motivation

Test Statistic	bPPT	iPPT
Mean	4.407	4.833
Variance	0.464	0.175
N	36	36
Pooled Variance	0.319	
Hypothesized Mean Difference	0	
df	70	
$t_{calc.}$	-3.197	
p-value (two-tail)	0.002	
$t_{critic.}$	1.994	

In Table 5, *p*-value=0.002 gives us the probability that a value of $t_{calc.}$= -3.197, if in an absolute value is larger than $t_{critic.}$=1.994. Since the *p*-value is larger than α=0.05. It indicates that there is a significant difference between students' motivation when bPPT and iPPT were used.

The study of Andini et al. (2024) showed that iPPT presentations boost comprehension and motivation by incorporating dynamic elements like animation, videos, and sound, making educational content more captivating and supportive of the learning process.

Table 6. Statistical difference in students' perceptions of bPPT vs. iPPT on learning

Test Statistic	bPPT	iPPT
Mean	4.396	4.764
Variance	0.401	0.214
N	36	36
Pooled Variance	0.308	
Hypothesized Mean Difference	0	
df	70	
t Stat	-2.815	
p-value (T<=t) one-tail	0.003	
t_{critic}	1.667	
p-value (T<=t) two-tail	0.006	
t_{critic} two-tail	1.994	

Table 6 reflects the students' perceptions of learning. Specifically, the mean score of students' learning when bPPT was utilized is equal to 4.396, and its variance is 0.401. On the other hand, the mean score and variance of students' learning when iPPT was utilized were 4.764 and 0.214 respectively.

In Table 6, *p*-value=0.006 gives us the probability that a value of $t_{calc.}$= -2.815. if in an absolute value is larger than $t_{critic.}$=1.994. Since the *p*-value is larger than α=0.05.

Herewith, there is a significant difference between students' learning when bPPT and iPPT were integrated in their Mathematics class.

In the study by Ha and Im (2020), the use of interactive visual learning tools in online activities improves students' flow experience and actual performance. Similarly, in the study of Almacen and Labitad (2024) multimedia tools foster greater student engagement which can enhance learners' academic performance.

CONCLUSION

Based on the study's results, it can be concluded that Physical Education students generally have a positive perception of bPPT. However, the dependent variables—active participation, motivation, and learning—were not fully realized. Only 49% of students felt fully active during class, likely due to the lack of interactivity in the presentation. Additionally, 55% of students were highly motivated, which could be attributed to the absence of a motivational activity or game. Only 52% of students reported maximum learning. Some neutral responses suggest that bPPT may not effectively provide a meaningful learning experience for all students.

This study found that Physical Education students had a positive perception of iPPT in terms of activeness, motivation, and learning. Students felt that iPPT effectively captured their attention and increased engagement. The majority (86%) strongly agreed that it motivated them to actively participate in class, with 18% agreeing and 5% remaining neutral. The results also showed a significant difference between the use of bPPT and iPPT, with students demonstrating higher levels of activeness, motivation, and learning with iPPT. Overall, students had favorable attitudes toward iPPT, feeling more engaged and learning better compared to bPPT.

Based on the findings and conclusions of the study, the following conclusions were drawn: 1) the teachers should make their presentations as interactive as possible for better learning experiences; 2) avoid using plain templates for the design as they lack visual appeal, instead be creative in designing the slides; 3) include a motivational game using the PowerPoint to motivate learners; and 4) the College of Education may conduct a webinar about proper designing of iPPT. 5) Future studies could explore other types of multimedia tools and their impact on learning to provide more insights into effective teaching strategies, especially in subjects like Mathematics.

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