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ClassPoint to Classroom Learning Enhancement: An Interventional Tool Integrated in PowerPoint Presentations

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Abstract

This research investigated the effectiveness of interactive ClassPoint presentations in enhancing students' engagement and understanding of Science concepts in Grade 8. A quasi-experimental design with a quantitative follow-up survey was employed in this study. The participants were the 50 Grade 8 students who were divided into control and experimental groups, each comprising 25 learners. The control group was exposed to regularly-used teaching modalities,including PowerPoint presentations. Meanwhile, the experimental group was employed with ClassPoint presentations. A pre-test/post-test was used to measure effectiveness, and a survey questionnaire was used to gather students' feedback on ClassPoint. The gathered data was analysed using the Wilcoxon signed-rank test, Mann-Whitney U test, and Frequency distribution. Findings revealed that the utilisation of ClassPoint presentations has significantly improved the scores of the students and is a better teaching modality when compared to the other learning modalities used. In addition, over half of the students strongly agreed that ClassPoint has increased their motivation (64%) and their engagement in the class (56%). This feedback aligned with their strong agreement that lessons were lively and interesting (64%), andClassPoint's display slides helped them to focus and follow the teacher's presentation better (68%). Nearly half (48%) also found these activities helpful for self-reflection on their learning progress. These findings suggested that ClassPoint can be employed as an alternative learning strategy for Science 8.

Keywords: ClassPoint; Interactive Learning; Instructional Strategy

Introduction

Keeping students engaged in class can be a challenge. Traditional teaching methods, like lectures and slides, might not always capture their attention. This can lead to students feeling bored and having trouble understanding the material. To counter this, active teacher-student interactivity is essential.

Active student participation in the classroom is a strong indicator of learning progress. When students participate, they can build on what they know, show that they understand the material, gain confidence, and apply what they've learned (Susak, 2016). Many studies have shown that students who participate actively in class tend to do better in school. In the study of Konold, et al. (2018), where more than 60,000 students participated, they discovered that class participation had a significant impact on how well students learn. This was supported by Bekkering and Ward (2020) who concluded

that students who participated more tended to have better scores. The research findings from Akpur (2021) also indicated that taking part in class activities is a significant variable in promoting academic achievement. All these studies highlight that when students engage, it positively influences their academic performance.

However, when face-to-face classes resumed after a two-year closure of schools, it was often observed that many students were hesitant to participate in class discussions. It was also noted that these students tended to score lower on assessments, which contributed tolowering the Mean Percentage Score (MPS) of the class. For the first and second quarters of school year 2022-2023, the average MPS in Science 8 for the two classes handled by one of the researchers was around 83%. The heterogeneous nature of the classes could have contributed to this situation since each class was composed of students with different learning styles, academic abilities, and socio-economic backgrounds. Other reasons that could have limited them from participating include fear, low self-confidence, and being unprepared. The students mentioned that they felt shy about participating because they were worried their answers might be wrong.

Given the pivotal role of Science in fostering essential skills like scientific inquiry, objectivity, curiosity, and critical thinking, which are crucial for personal, professional, and lifelong development (DOST-SEI, 2011), there is a need to enhance teaching strategies to improve students' participation and at the same time improve their academic performance. Enhancing teaching strategies can be achieved by integrating technology, such as using mobile phones through ClassPoint presentations, into Science lessons. Since mobile phones are now equipped with various functionalities, they can facilitate knowledge sharing, encourage interactive as well as participatory learning, and support both online and offline learning (Ananayo, 2022).

ClassPoint, integrated into Microsoft PowerPoint, transforms teaching by making learning interactive. With ClassPoint, advanced annotation and teaching tools could be used to highlight key points during live class presentations. Additionally, interactive activities and quizzes – such as quick poll, word cloud, multiple choice, short answer, image upload, fill in the blank, audio upload, video upload, and draggable objects – are integrated to make the class engaging. All of these activities can be included in any part of the lesson. Furthermore, a gamified reward system has been embedded to reward students for their participation through the awarding of stars, levels, badges, and leaderboards.

The use of ClassPoint presentations as a teaching approach aligns with the department's vision of holistically developing learners, utilising Information and Communication Technology (ICT) as a powerful tool in delivering curriculum content as well as employing differentiated approaches (DepEd Order No. 21, 2019). In addition, this strategy is anchored on the e-learning theory. This theory is built on cognitive science principles that demonstrate how the use and design of educational technology can enhance effective learning. These principles include: (1) Multimedia principle. It uses two formats of audio, visual, and text instead of using one; (2) Modality principle. It explains visual content with audio narration instead of on-screen text; and (3) Learner control principle. It allows the learner to control their learning pace (He, n. d. as cited in Ananayo, 2022).

While studies have explored the effectiveness of ClassPoint in online learning, its impact on face-to-face learning, particularly in Science, remains largely unexplored. Therefore, the researchers explored the impact of maximising the use of mobile phones through ClassPoint presentations to enhance students' participation and learning outcomes in a purely face-to-face classroom setting, specifically in Science.

Methodology

Research Design

This study employed a Quasi-experimental design with a quantitative follow-up survey utilising Likert scales. A quasi-experimental **design** is a type of research design that resembles an experimental design but lacks random assignment to treatment or control groups (Creswell & Creswell, 2017).

This type of design was chosen for the study because it was difficult to randomly assign participants to be part of the control and experimental groups. This is due to the fact thatthe two sections involved in this study were formed at the beginning of the school year and have different schedules for Science classes. Despite the situation, this design still allowed the researchers to investigate the effectiveness of the intervention (ClassPoint) in enhancing mastery and class participation as well as establishes a cause-and-effect relationship between the intervention and learning outcomes.

Participants

The participants in this study were the students enrolled in Grade 8 Sapphire and Amethyst classes at San Antonio Integrated School in Diffun, Quirino, Philippines, during the 2022-2023 school year, when classes returned to in-person learning. The study utilised the total enumeration technique, also known as universal sampling, a type of purposive sampling technique that involves selecting every single member of a defined population for inclusion in a study (as defined by Australian Bureau of Statistics, n.d.). Through this sampling technique, all the students from the two sections were taken as respondents. The researchers preferred to use this technique in selecting respondents due to the small population of Grade 8 and because they are currently handled by one of the researchers. The researchers believed that the students could provide valuable information for testing the research hypothesis.

The two sections were both composed of students who possess and do not possess mobile phones. To ensure equivalence between the experimental as well as the control group and to eliminate other factors that might affect the validity of research results, their General Weighted Average (GWA) for the first and second quarters were considered. The two groups have almost the same quarterly GWA based on the teacher's class record. The control group and experimental group were identified after the administration and analysis of the pre-test.

Instrument

The test questions were adapted from DepEd textbooks and modules aligned with the competencies. Science experts assessed the tool's validity, resulting in an Individual Content Validity Index of 0.93, indicating strong validity. A grammarian also reviewed the instrument for grammatical accuracy. After revising items with low validity scores, the instrument was pilot-tested with a Grade 8 class from Cabarroguis National School of Arts and Trades, achieving a Cronbach's Alpha of 0.85, indicating good reliability.

Data Collection

Before the study was conducted, approval was sought from the school head, district, division and regional leaders. Then, the researchers ensured consent from the parents for the participation of the students in the study. After which, the learners were oriented. A pre-test was administered to both the control and experimental groups to assess their initial ability and identify any potential confounding variables that might affect the objectivity of the study. After the conduct of the pre-test, ClassPoint was applied to the experimental group. At the same time, regularly-used modalities, including PowerPoint presentations, were employed in the control group during the given period for Science 8. This setup took place for the whole three weeks duration of the implementation of the intervention. Two weeks after the intervention period, all learners were

subjected to a post-test to find out if there is a significant change in their scores.

A post-experiment survey using Likert scales was also conducted to gather students' feedback on the intervention. This method was applied in this study to describe the students' perception on the intervention and provide valuable insights into their experiences. The learners from the experimental group answered a survey questionnaire adapted from the study of Bong & Chatterjee (2022), which was slightly revised to suit the needs of this study. The five-statement survey employed a four-point Likert scale to quantify student perceptions.

Results and Discussion

The data distribution was first assessed for normality using the Shapiro-Wilk test with a significance level of 0.05 (Van den Berg, n. d.).

Table 1. Result of Data Normality Test

	Group	df	p-value	Analysis
Pre-test	Control	25	.041	Not normally distributed
	Experimental	25	.042	
Post-test	Control	25	.008	
	Experimental	25	.000	

Examining the table revealed that in the pre-test, the control group had a Sig. value of .041 whereas the experimental group obtained .042. In the post-test, the control group achieved a Sig. value of .008, while the experimental group obtained .000. These findings indicated that the data from both the control and experimental groups, in terms of pre-test and post-test scores, do not exhibit a normal distribution.

Table 2. Mann-Whitney U Test for the pre-test

	N	Median	Mann-Whitney U	Z	p-value	Interpretation
Control	25	10	298.500	.274	.784	Not Significant
Experimental	25	10				

$\alpha = .05$

The results of the pre-test showed no statistically significant difference ($Z=.274$, $p=.784$) between the average initial ability of the students in the control and experimental groups. This suggests that the two groups were comparable in terms of their cognitive level before the intervention, making them suitable for comparison after the ClassPoint implementation.

Table 3. Significant difference between the pre-test and post-test scores of students in each group

Group	N	Mean Rank	Sum of Ranks	Z value	p-value	Interpretation	Effect Size (r)
Control Group							
Pre-test	25	13.00	325.00	4.376	.000	Significant	0.618 (large)
Post-test	25						
Experimental Group							
Pre-test	25	13.00	325.00	4.377	.000	Significant	0.619 (large)
Post-test	25						

r: small effect (<0.3), medium effect (0.3-0.5), large effect (>0.5) *α =.05*

Table 3 presented the results of the Wilcoxon signed-rank test, examining the significant differences between the pre-test and post-test scores among students in each group. In the control group, a Z-value of 4.376 and a p-value of .000 indicated a statistically significant difference, with the post-test scores exceeding the pre-test scores (as implied by the positive Z-value). Furthermore, the r value of 0.618 indicated a large effect size, suggesting that the use of PowerPoint and other regularlyused teaching methods had a substantial impact on learning outcomes. The combination of PowerPoint presentations and other traditional teaching methods, such as class discussions, proved to be an effective approach in enhancing student understanding. This result is consistent with the study by Shigli, et al. (2016) who concluded that PowerPoint presentation is an effective tool for improving knowledge regarding gerontology. This observation also aligns with the findings of Hadiyanti and Widya (2018), who emphasized that students perceived PowerPoint presentations as advantageous for learning and understanding lessons due to their structured format, and focus-retaining features. However, Hadiyanti and Widya (2018) also found that some students were not motivated to attend classes with PowerPoint presentations, as it made them feel bored and did not allow them to participate in classroom discussions.

For the experimental group, the Wilcoxon signed-rank test also indicated a statistically significant difference between the pretest and posttest scores ($Z = 4.377$, $p = .000$). The effect size was large ($r = 0.619$), suggesting that ClassPoint has a great impact also on learning outcomes, reflecting its effectiveness in enhancing student performance. This result supports the findings of Yusi (2023) who concluded that ClassPoint has a positive effect on students' performance, as it increased their achievements on the mathematics test.

Table 4. Significant difference between the posttest scores of students from the experimental and control groups

	N	Median	Mann-Whitney U	Z	p-value	Interpreta-tion	Effect size (r)
Control	25	36	198.500	2.151	.026	Significant	0.315 (medium)
Experimental	25	39					

r: small effect (<0.3), medium effect (0.3-0.5), large effect (>0.5) *α =.05*

The Mann-Whitney U test was used to compare the scores of the students who were exposed to ClassPoint (experimental) and those who were exposed to regularlyused

teaching method (control). The experimental group exhibited a higher median score of 39 compared to the control group (Mdn=36). The statistical analysis also revealed a significant difference between the two groups (Z=2.151, p=.026). These results suggest that the experimental group performed better than the control group and that it could be attributed to the intervention used. Moreover, the effect size (r=0.315) was determined to be of medium magnitude, which means that the difference between the two groups is not small, but it is not large either. This indicates that ClassPoint has a moderate impact on student performance compared to the regularlyused teaching methods.

The superiority of ClassPoint over PowerPoint and other teaching methods used when it comes to enhancing student performance could be due to the interactive and gamified features of ClassPoint which is absent in a mere PowerPoint presentation. As studies have proven, the integration of interactive activities (Yusuf, 2015; Mallari & Lumanog, 2020) and gamified features (Ng & Lo, 2022) into instruction could significantly improve students' academic performance. This could be because employing interactive tools and technologies promotes participation and inclusive learning, resulting in enhanced student engagement and interest during classroom activities (Ullah & Anwar, 2020). Furthermore, Nasu and Alfonso (2018) highlight that interactive game-based activities not only reduce boredom but also facilitate active learning, leading to better retention and understanding of material. However, Phungphai and Boonmoh (2021) concluded that implementing rewards can serve as positive reinforcement to encourage students' desire to learn. When Leftheriotis et al. (2017) explored the potential of gamified interactive display technology to enhance knowledge consolidation and student engagement, their findings revealed that incorporating gamified interactive display applications into learning activities can effectively support the learning process because students found the game enjoyable, making them participated actively. Additionally, the students performed significantly better on a cognitive test administered after playing the game.

Table 5. Students' Perception of Learning Experiences with ClassPoint

Statements	Frequency/Percentage			
	Strongly Disagree	Disagree	Agree	Strongly Agree
I experienced greater interaction and engagement with my peers and my teacher when ClassPoint was used in the class.	0/0	2 / 8%	9 / 36%	14 / 56%
The ClassPoint has motivated me to participate in the activities more often in the class.	2 / 8%	0/0	7 / 28%	16 / 64%
The interactive activities in ClassPoint helped me to self-evaluate how well I was learning during classes.	2 / 8%	0/0	11 / 44%	12 / 48%
The lessons are lively and interesting when my teacher runs the class using ClassPoint than a class without the use of ClassPoint.	0/0	0/0	9 / 36%	16/ 64%
ClassPoint's display slide allows me to follow along and pay more attention to the teacher's presentation.	0/0	0/0	8 / 32%	17 / 68%

N=25

A survey of 25 students from the experimental group revealed positive feedback about ClassPoint's impact on learning. Over half (56%) strongly agreed

that they found the lessons more engaging and interactive, with 64% reported increased motivation to participate due to ClassPoint's engaging activities. Nearly half (48%) found these activities helpful for self-reflection on their learning progress, and 64% found the lessons lively and interesting. Notably, 68% felt ClassPoint's display slide helped them focus and follow the teacher's presentation better. These feedback suggest that ClassPoint has the potential to significantly enhance students' engagement, self-evaluation, and focus in the classroom.

One factor that could have contributed to the notable engagement of students during classes with ClassPoint is the anonymity feature during interactive sessions. This sense of anonymity, wherein students can actively participate without revealing their identity, serves to boost their confidence. Students may feel more at ease expressing their thoughts, contributing answers, and engaging in class activities, as they are free from concerns about potential judgment and embarrassment. They could actively participate without the fear of being ridiculed for giving incorrect answers. This is supported by Stanley (2021), who mentioned that anonymous platforms can boost student confidence, engagement, and inclusivity.

Conclusion

The scores of the group employed with ClassPoint and the group without ClassPoint increased significantly after the implementation, demonstrating effectiveness of both strategies in enhancing learning outcomes in Science 8. However, ClassPoint is superior or better compared to other modalities used when it comes to enhancing students' academic performance. This advantage of ClassPoint is not solely reflected in scores. Over half of the students strongly agreed that ClassPoint has enhanced their engagement and focus on the classroom, while almost half strongly agreed that ClassPoint has enhanced their self-evaluation. Over half also strongly agreed that lessons are lively and interesting with ClassPoint and that it has motivated them to participate more often in the class. These positive student perceptions further underscore the effectiveness of ClassPoint in fostering a more enriching and impactful learning environment.

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