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UNVEILING THE PEDAGOGICAL IMPACT: A COMPARATIVE ANALYSIS OF MULTIMEDIA PRESENTATION TOOLS IN SHAPING STUDENTS' LEARNING ACHIEVEMENT

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ABSTRACT

Introduction: Recent studies have emphasized the significance of combining visual elements with textual content to optimize learning outcomes. Referred to as the interactive multimedia hypothesis, this principle accentuates the role of immersive audio-visual experiences in education. Initially revolutionizing content delivery, PowerPoint, introduced by Microsoft in 1990, paved the way for multimedia presentations. However, the advent of "Prezi" in 2009 introduced a novel approach to presentation software, potentially posing a challenge to PowerPoint's longstanding dominance.

Objective: This study aims to evaluate the effectiveness of PowerPoint and Prezi in facilitating learning through a series of assessments focusing on knowledge acquisition and retention.

Materials and Methods: This quantitative experimental study was conducted at Fatima Memorial College of Medicine and Dentistry in Lahore, involving 66 final-year BDS students who volunteered for participation.

Results: Analysis of the data from 66 participants revealed notable differences in mean scores between the PowerPoint and Prezi groups in both knowledge acquisition and retention tests. The Prezi group consistently outperformed the PowerPoint group in both immediate knowledge acquisition and long-term retention assessments.

Conclusion: The findings indicate a statistically significant advantage of Prezi over PowerPoint in facilitating learning acquisition and retention. These results underscore the potential of Prezi as a more effective instructional tool for multimedia presentations.

Keywords: Multimedia presentation, Students' learning, Prezi, PowerPoint

INTRODUCTION

In recent years, the field of educational technology has seen an incredible evolution, providing educators with a diverse range of multimedia presentation tools and platforms to engage students in new and innovative ways(Martín et al., 2011). These multimedia technological advancements have transformed the nature of learning and teaching, enabling educators to create dynamic and interactive learning experiences for their students(Adi et al., 2022). This study will explore the impact of two multimedia presentation tools, PowerPoint and Prezi technology, on education and delve into the exciting possibilities it presents for both educators and learners. The impact of technology on education is multi-faceted, influencing not only the way information is presented but also how students interact with and retain that information(Елисафенко & Protasova, 2019). With the rise of immersive technologies such as virtual and augmented reality, students can now experience simulations and visualizations that were previously only possible through text or static images. These advancements in educational technology have opened up new avenues for personalized learning, allowing students to engage with material in a way that suits their individual learning styles(Junqi, n.d 2023).

The integration of technology has also revolutionized the assessment and feedback process. Platforms like Kahoot and Quizlet allow educators to create interactive quizzes and games, providing instant feedback to students and enabling a more dynamic approach to evaluating their understanding of the material (Zewdie, 2024). This shift towards real-time feedback not only supports active learning but also empowers students to take ownership of their learning journey.

In addition to the multimedia presentation tools and platforms available, the role of the educator has also evolved in the digital age. Teachers are now tasked with not only delivering content but also guiding students in navigating the vast landscape of online resources and discerning credible sources from misinformation(Nguyen & Habók, 2023). The ability to critically evaluate information has become an essential skill in the digital era, and educators play a crucial role in fostering digital literacy among their students(Trixa & Kaspar, 2024).

PowerPoint has been the go-to software for structured presentations, Prezi has introduced innovative functionalities that allow for a more fluid, sprawling approach to presenting content (Rosmiati & Siregar, 2021). Despite the ability of PowerPoint to incorporate engaging elements such as video, audio, and links, its slides packed with information can become a barrier to dynamic discussion and thoughtful analysis(Garner & Alley, 2011).

PowerPoint's ingrained hierarchy in displaying information has been a point of contention, with some educators believing it stifles more lively teaching techniques(Levasseur & Sawyer, 2006). Yet, the evidence to back these views is still insufficient. Direct studies contrasting PowerPoint and Prezi in terms of their effectiveness in facilitating learning show mixed results, with some indicating that PowerPoint can foster engagement, but might also contribute to passive learning and reduced interaction(Baker et al., 2018).

MATERIAL AND METHODS

The experimental study conducted at Fatima Memorial College of Medicine and Dentistry in Lahore involved 66 final-year BDS students, employing census sampling to ensure diverse representation. Participants were divided into two groups based on academic performance, facilitating a balanced comparison of presentation styles. Analysis of the data utilized descriptive statistics, paired t-tests, and repeated measures of ANOVA, revealing insights into the impact of presentation styles on learning retention.

RESULTS

The study sheds light on the nuanced dynamics of multimedia presentations in educational settings, drawing upon both empirical evidence and contemporary literature. The demographic details are given below in table 1.

Demographic Details:

Study year	Total Class students			Participants given written consent		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
4th year BDS	14	61	75	12	54	66

Table 1 Demographic details

The study embarked on a comprehensive examination, commencing with a pre-test to establish the baseline knowledge of participants. Analysis of mean scores and standard deviations, augmented by an independent t-test, revealed minimal disparities in the capabilities of students between the PowerPoint and Prezi groups, thus laying a solid groundwork for equitable comparison.

Our findings echo existing literature, emphasizing the significance of considering participants' initial knowledge baseline when assessing instructional interventions. This resonates with the notion that the effectiveness of educational strategies, including multimedia presentations, is intricately linked to participants' prior knowledge and proficiency. The meticulous scrutiny of pre-test scores adds depth to our investigation, ensuring that subsequent assessments accurately capture the influence of presentation software on knowledge acquisition and retention.

Comparative Analysis Pre-test, Acquisition test & Retention test				
	Intervention	**Mean**	**Std. Deviation**	**p-value**
Pre-test	PowerPoint	4.58	1.32	0.01
	Prezi	4.70	0.95	
Acquisition Test	PowerPoint	7.64	0.99	0.01
	Prezi	8.82	1.23	
Retention Test	PowerPoint	7.17	0.99	0.01
	Prezi	8.67	1.23	

Table 2 Pre-Test, Acquisition Test & Retention Test

Table 2 illustrates the participation of 66 students in the study, highlighting significant differences in mean scores between the two intervention groups across Knowledge Acquisition and Retention tests. Particularly, the PowerPoint group demonstrated inferior performance in both aspects compared to the Prezi group. Evaluation of learning outcomes encompassed immediate responses in Knowledge Acquisition, while long-term retention in the Knowledge Retention test suggested that both presentation software platforms effectively facilitate student learning.

Analysis of mean scores and standard deviations, bolstered by an independent t-test, indicated minimal differences in student capabilities between the PowerPoint and Prezi groups, laying a robust foundation for fair comparison. These findings align with existing literature, underscoring the importance of considering participants' initial knowledge baseline when evaluating instructional interventions. This underscores the notion that the efficacy of educational strategies, including multimedia presentations, hinges on participants' prior knowledge and proficiency.

Further examination, as depicted in Table 2, elucidated significant disparities in mean scores between the two intervention groups across Knowledge Acquisition and Retention tests. Specifically, the PowerPoint group exhibited lower performance in both domains compared to the Prezi group. Immediate comprehension in the Knowledge Acquisition test and sustained memory retention in the Knowledge Retention test revealed the effectiveness of both presentation software platforms in facilitating student learning. However, the superior performance of Prezi users, spanning from immediate comprehension to long-term memory retention, contrasted with their PowerPoint counterparts.

The comparative analysis summarized in Table 2 highlights the significant impact of presentation software on student learning outcomes, emphasizing Prezi's superiority over PowerPoint in enhancing both immediate understanding and long-term retention. These results underscore the critical role of multimedia presentations in shaping students' learning experiences and proficiency levels.

DISCUSSION

The examination of PowerPoint and Prezi within this study leads us through the latest academic work to shed light on the changing nature of multimedia presentations in the sphere of medical education. Our conclusions are in harmony with current research, which casts a spotlight on the transformative effects that modern tools like Prezi can wield in presentations(Rosmiati & Siregar, 2021). The research points to Prezi growing in educational institutions due to its dynamic structure, offering non-linear progression and the ability to zoom, effectively engaging viewers(Educational resources, 2020). This represents a significant shift away from the more traditional, linear design of PowerPoint, indicating a trend towards interactive, visually stimulating presentations that encourage active participation in the learning experience.

The dialogue surrounding the role of multimedia in presentations emphasizes the necessity for visual engagement in instruction. While studies acknowledge PowerPoint's longstanding ubiquity as a tool for multimedia presentations, our analysis suggests that the efficacy of such tools may vary depending on the type of content, instructional objectives, and the learning preferences of students(Baker et al., 2018).

Concerning the durability of learning, our findings resonate with recent academic discussions that highlight the significance of sustained knowledge over time(Yanto & Warsono, 2020). Summative assessments administered after a delay demonstrate that, although both PowerPoint and Prezi aid in maintaining knowledge, Prezi tends to offer a greater degree of retention.

In the present era of instructional innovation, educators must consider both the structure of PowerPoint and the immersive, connective capabilities of Prezi. It has been suggested that faculty development initiatives and ongoing adaptation to teaching methods are essential in keeping with the rapidly changing landscape of education(Nathan, 2016). As the instructional environment continues to evolve, research indicates that some educators might not fully grasp how to engage students effectively through PowerPoint, potentially leading to a lack of student interest in the material presented. This concern underscores the importance of continual professional growth for educators to efficaciously harness the advancements in presentation software and maximize their impact on teaching and learning(Špernjak, 2014).

CONCLUSION

In conclusion, this study contributes to the ongoing discourse on multimedia presentations in medical education. It catalyzes continued exploration into the dynamic interplay between presentation software and student learning outcomes. Enriched by contemporary literature, our discussion advocates for a flexible and informed approach where instructors harness the strengths of each presentation medium to create engaging and effective learning environments. As the educational landscape evolves, integrating innovative technologies will undoubtedly shape the future of instructional design and delivery.

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