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ORIGINAL ARTICLE

Comparison of Effectiveness of PowerPoint and Prezi on Students' Learning Performance

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ABSTRACT

Introduction: Recent studies have showed that student learn more significantly by the blend of words with pictorial outlines related to the topic than the words alone. So this avowal can be known as the interactive multimedia postulate, and it shapes the foundation for using sight and sound learning. Microsoft made PowerPoint in 1990. It is a PC program used for showing specific progressed content to target academic/social occasions of individuals. In mid-2009 new freeware programming was determined and named "Prezi", which maybe supplant the piece of PowerPoint.

Objective: The aim of this study is to evaluate the two presentation software in regards to their effectiveness by measuring through the series of assessments after the teaching session in Knowledge acquisition and knowledge retention test.

Material & Method

Methodology: This was a Quantitative Experimental study which was conducted in the Fatima Memorial college of Medicine and Dentistry Lahore. The participants were 66 of final year BDS students who voluntarily participated in the research project.

Results: A total of 66 students participated in the study and it was found a significant difference between the two intervention groups regarding the mean scores of Knowledge acquisition and knowledge retention test. The PowerPoint group showed lower grades in Knowledge acquisition and knowledge retention test in comparison with Prezi group. The learning performances was evaluated from immediate learning responses in Knowledge acquisition and in long term learning retention.

Conclusion: In light of measurable results and significant p-values. A noteworthy contrast was observed in the knowledge acquisition test, and in knowledge retention assessments of the students allocated by PowerPoint and Prezi instructions. The consequences of the distinctive sorts of test showed that Prezi was a more viable instructional software for learning securing.

Keywords: PowerPoint, Prezi, Multimedia presentation, learning performance

INTRODUCTION

Student learn more significantly by the blend of words with pictorial outlines related to the topic than the words alone. So this declaration can be known as the interactive multimedia postulate, and it shapes the foundation for usingsight and sound learning. The Multimedia rule contains words (like-spoken substance or printed content) and configuration (like-, photos, action, outlines, diagrams, or video) that is relied upon to propel learning (Chou, Chang, & Lu, 2015a). Microsoft made PowerPoint in 1990, it is a PC program used for showing specific progressed content to the target audience. In early 2009 a new freeware software was derived and named as "Prezi", which perhaps replace the part of PowerPoint. At that time the Microsoft PowerPoint software was dominating the world of presentations. The critical attributes of Prezi are limitless material and nonlinear show style.

Concerning learning execution of students, asserted that sight and sound components, for example, video, sound, and hyperlink archives inserted in PowerPoint slides proficiently show learning materials, which pulls in the prospect of learners and strengthens their reasoning process. (Chou, Chang, & Lu, 2015b). A study shows, 57 out of 100 medical students revealed that the most exhausting variable in the PowerPoint presentations is extensive number of slides for one subject with of brimming with content in them (Abusharib, Nourein, and Huneif, 2015).Most of the time PowerPoint presentations diminish the discussion section and the basic thinking about the students as they are sitting inactively without taking notes. Another confinement is that it decrease the checking and examining capacity of the teachers on their students. Essentially, these constraints are inalienable or worked in the program and it is difficult to skip them totally (Lois, 2014; Russell and Joel, 2006). The PowerPoint diagram rule develops various leveled styles wherein a show of informational material packs the basic information about the topic and allows instructors in a very much arranged way. Regardless, such an effective component yielded a couple of negative comments from school educators. For example, seriously investigated the utilization of PowerPoint show programming in the study hall, battling that the mental method of giving PowerPoint introductions changed instructors into dictators who completely controlled and gave viewers compelled substance loaded into slides. In the midst of this straight-based presentation,

fundamental information is dispersed on different slides, and as needs are, outlining thought associations is irksome. Nevertheless, strong exploratory examination really cannot certify this case (Kiss, 2016). There is limited number of researches which shows the actual comparison between PowerPoint and Prezi presentation on students' learning performance like (Chou et al., 2015a; Brock & Brodahl, 2013). Number of studies show students instructed with Prezi presentations have more conceptual learning than that of PowerPoint presentation (Akgün, Babur, & Albayrak, 2016; Artino, 2008). Another study by Brock and Joglekar (2011) revealed in favor of PowerPoint presentation in a microbiology course that they analyzed the linkage amongst PowerPoint and students levels of engagement and investigated the viability of this broadly utilized presentation software. Swati, Suresh, and Sachin Methodoli (2014) found that PowerPoint presentations are engaging the students during their course classes. The results of a study shows majority 98.6% (73/74), found Prezi to be a more engaging experience compared to other styles of presentation medium. (Duffy, Guerandel, Casey, Malone & Kelly, 2015). Daka (2019) and Daka, Namafe & Katowa – Mukwato (2019) found out in their studies that some instructors lack the knowledge of how to use the PowerPoint software thereby failing to engage the students.

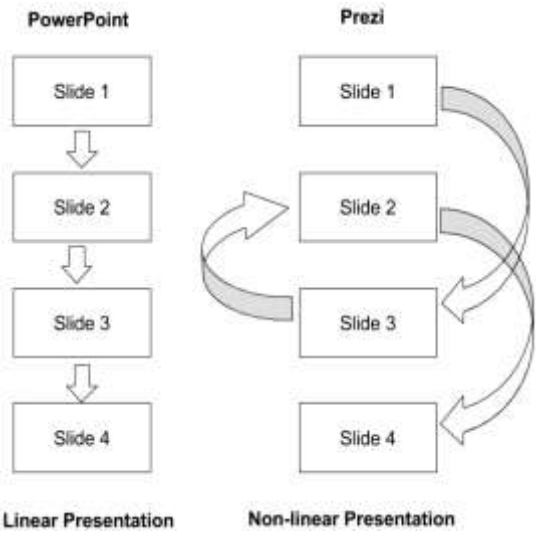

Fig 1: 1 explains the clear difference between the two presentation software.

MATERIAL AND METHODS

This Experimental study involving two groups of participants of Bachelors of Dental surgery final year students who voluntarily participated with written consents, and was conducted at Fatima Memorial College of Medicine and Dentistry (FMH) Lahore, Pakistan. FMH College of Medicine and Dentistry is a private institution, recognized by the Pakistan Medical Commission PMC and affiliated with the University of Health Sciences (UHS) Lahore.

In this study, the 75 students were given the consent form and out of 75, 66 gave the written consent to participate in the study. Students were from the Final year of Bachelors of Dental Surgery (BDS) program at Fatima Memorial College of Medicine and Dentistry participated in the study by voluntarily participation with written consents. Participants of the study was divided into two equal groups of 33 students each. The selection of participants for both the groups were made on the basis of previous professional UHS result so that both the groups will have same caliber of students from excellent to poor. This division of students was done in collaboration with the department of Student affairs to provide data of student's previous academic results of UHS. Census Sampling was used in this study where the entire population was included for conduction of a study. This happens when the entire population is small in number or it is reasonable to include the entire population, so in this study researcher invited all the participants of final year BDS and those who gave the written consents were included in the study.

Data were analyzed using SPSS Version.22.

- For Descriptive Statistics: Mean, Standard deviation, Paired t-test were applied.
- For analytical statistics: Repeated Measures of ANOVA was applied-Repeated measures is a term used when the same entities take part in all conditions of an experiment so in this current study both the treatment groups take part in the series of assessments with all the conditions remained fixed.

RESULTS

In this experimental study, which includes series of assessment method formulated to examine the learning retention of students from immediate learning response to long term learning retention which includes Pre-test, Post-test knowledge acquisition and knowledge retention as delayed summative test was adopted to evaluate the impacts of two multimedia presentation software on the learning performance of the students.

The presentation content made by the one class facilitator was independent variable and the learning achievements of students in the concerned subject which is Prosthodontics was the dependent variable. The series of assessments to check the learning performance of the students including formative assessment as Pre-test was conducted to check the level of knowledge (i.e. prior knowledge) regarding the presentation topic which was delivered through PowerPoint and Prezi software. Soon just after the delivery of the content through PowerPoint and Prezi software to the two groups, a Post-test was conducted to check the level of knowledge acquisition after the content delivery.

Students' learning performance was again evaluated to check the Knowledge retention after ten days of content delivery through PowerPoint and Prezi software to check the long term retention of the knowledge.

Table 1: Demographic details

Academic Year	Class Strength			Students participated in the Study		
	Male	Female	Total	Male	Female	Total
Final Year BDS	14	61	75	12	54	66

Table 2: Comparison between Pre-test, Knowledge Acquisition, Knowledge retention

	Intervention	Mean	Std. Deviation	p-value
Pre-test	PowerPoint	4.58	1.32	0.45
	Prezi	4.70	0.95	
Knowledge Acquisition	PowerPoint	7.64	0.99	0.00
	Prezi	8.82	1.23	
Knowledge retention	PowerPoint	7.17	0.99	0.00
	Prezi	8.67	1.23	

Table 2 shows a total of 66 students participated in the study and it was found a significant difference between the two intervention groups regarding the mean scores of Knowledge acquisition and Knowledge retention test. The PowerPoint group showed lower grades in Knowledge acquisition and Knowledge retention test in comparison with Prezi group. The learning performances was evaluated from immediate learning responses in Knowledge acquisition and in long term learning retention in Knowledge retention test showed that both the presentation software can be used as a presentation medium and students do learn from both but Prezi presentation software students are superior in learning performances from immediate learning to long term memory retention as compared to PowerPoint presentation software.

DISCUSSION

This study highlights the major difference between two Multimedia presentation software and this multimedia presentation software is the backbone of our daily academic sessions in medical schools. Microsoft PowerPoint is the most frequently used multimedia presentation software (Thompson, Mcnutt, & Ky, 2009) in our daily life and facilitators use it for their own feasibility. Prezi is new technology and this multimedia presentation software is now dominating the presentation market where the facilitators wants to engage the listeners from start till the end of presentation by showing them more attractive slides with non-linear sequencing and its zooming effects makes the presentation more engaging (Masri, Ismael, & Qudah, 2015) and with evidence of this study the Prezi presentation group found superior in the learning performance of the students than the PowerPoint presentation group in the subject of Prosthodontics.

In our study the Pre-test scores mean and standard deviation and independent t-test applied which shows both the intervention groups are of equal caliber regarding the knowledge of topic that there was difference of only 0.12 between the mean scores of two groups and it was the strengthening aspect of the study that results will be more accurate to evaluate the learning performance of the students. In the Pre-test and Knowledge acquisition test, there is clear contrast seen between PowerPoint and Prezi presentation group and it tells that the learning has occurred by both of the presentation medium. The mean scores of delayed test as knowledge retention exam shows a different aspect of results that the retention of the knowledge by both the presentation medium has occurred but the sustainability of knowledge in Prezi group is superior to the PowerPoint group. Regardless to the presentation software all the presentation instructors should attend faculty development workshops on Prezi and PowerPoint presentation software and read the available literature on effective presentations like (Northwest Center for Public Health, 2012). From a guideline and learning point of view, the instructional adequacy of PowerPoint guideline has an indistinguishable weight from that of conventional direction. This finding is reliable with Apperson et al. (2008) who revealed that PowerPoint direction did not fundamentally enhance students learning. The literature suggests that there should not be more than three stems in one slide or there should- not be more than 20 words per slide.(Brock & Joglekar, 2011).With reference to our current study, instructor should use Prezi when they want to make connections between different topics or in a single topic to make a storyline showing relationship from start till the end. For instance, if you want to present content in bulleted style then Prezi will not be a better presentation medium in that case. Instructor should use PowerPoint in that case.

CONCLUSION

The motivation behind this research was to look at the instructional viability of two presentation software on the learning execution of the students of private dental college of Lahore in the subject of Prosthodontics. In light of measurable results and significant p-values. A noteworthy contrast was observed in the knowledge acquisition test and in knowledge retention assessments of the students allocated by PowerPoint and Prezi instructions.

REFERNCES

1. Akgün, Ö. E., Babur, A., & Albayrak, E. (2016). Effects of Lectures with PowerPoint or Prezi Presentations on Cognitive Load , Recall , and Conceptual Learning. International Online Journal of Educational Sciences, 8(3), 1–11.
2. Artino, a. R. J. (2008). Cognitive load theory and the role of learner experience: An abbreviated review for educational practitioners. Association for the Advancement of Computing In Education Journal (AACE) Journal, 16(4), 425–439. Retrieved from http://www.editlib.org/p/25229
3. Atkinson, R. C. & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), The psychology of learning and motivation: Advances in research and theory (Vol. 2, pp. 89–195). New York: Academic Press, Inc.
4. Aiken, L. R., & Groth-Marnat, G. (2006). Psychological testing and assessment (12th ed.). Boston, MA: Allyn and Bacon.
5. Apperson, J. M., Laws, E. L., & Scepansky, J. A. (2008). An assessment of student preferences for PowerPoint presentation structure in undergraduate courses.
6. Asan, A. (2007). Concept mapping in science class: A case study of fifth grade students. Educational Technology & Society, 10(1), 186-195.
7. Apperson et al (2008) "An assessment of student preferences for PowerPoint presentation structure in undergraduate courses". Computers & Education, Vol. 50, No. 1, pp148-153.
8. Austin, K. (2009). Multimedia learning: Cognitive individual differences and display design techniques predict transfer learning with multimedia learning modules. Computers & Education, 53(4), 1339-1354. Computers & Education, 50, 148e153.
9. Ballentine, B. (2012). High concept and design documentation: using Prezi for undergraduate game design.

In Professional Communication Conference (IPCC) (pp. 1e5). Orlando, FL: IEEE.
10. Brian E. Perron and Alyson G. Stearns A Review of a Presentation Technology: Prezi. University of Michigan, Ann Arbor, MI, USA University of Oklahoma, Norman, OK, USA
11. Bartsch, R. A., & Cobern, K. M. (2003). Effectiveness of PowerPoint presentations in lectures. Computers and Education, 41(1), 77–86. http://doi.org/10.1016/S0360-1315(03)00027-7
12. Bender, C., & Bull, P. H. (2012). RESEARCH PAPERS USING PREZI TO MOTIVATE MIDDLE SCHOOL By, 7(3), 10–22.
13. Birch, P. M., Birch, B. P., Librarian, C. S., Taylor, W., & Law, M. (2013). Pointing out the Power of Prezi , Part I : Why Consider Prezi Pointing Out the Power of Prezi , Part I : Why Consider Prezi, 23.
14. Brock, S., & Brodahl, C. (2013). A tale of two cultures: Cross cultural comparison in learning the prezi presentation software tool in the us and norway. Journal of Information Technology Education: Research, 12(1), 95–119. http://doi.org/10.1215/01642472-2008-028; Alshare, K., Hindi, N.M.,
15. Chen, C., & Howard, B. (2010). Effect of live simulation on middle school students' attitudes and learning toward science. Educational Technology, 13(1), 133-139.
16. Casteleyn, J., & Mottart, A. (2012). Presenting material via graphic organizers in science classes in secondary education. Social and Behavioral Sciences, 69, 458e466.
17. Casteleyn, J., Mottart, A., & Valcke, M. (2013). The impact of graphic organisers on learning from presentations. Technology, Pedagogy and Education, 22(3),283e301.
18. Clark, J. (2008). PowerPoint and pedagogy: maintaining student interest in university lectures. College Teaching, 56(1), 39e45.
19. Chris Clark, University of Notre Dame, 3/14/13 – Creative Commons license
20. Clark, R. C., & Mayer, R. E. (2011). E-Learning and the science of instruction (3rd ed.). San Francisco, CA: Pfeiffer.
21. Casteleyn, J., Mottart, A. & Valcke, M. (2011). PowerPoint vs. Prezi – The impact of graphic organizers on learning from presentations. To be published in Technology, Pedagogy & Education.
22. Chularut, P. & DeBacker, T. (2004). The influence of concept mapping on achievement, self-regulation, and self-efficacy in students of English as a second language. Contemporary Educational Psychology, 29(3), 248-263.
23. Conboy, C., Fletcher, S., Russell, K., & Wilson, M. (2012). An evaluation of the potential use and impact of Prezi, the zooming editor software, as a tool to facilitate learning in higher education. Innovations in Practice, 7, 31e45.
24. Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). Thousand Oaks, CA: Sage.
25. Daka, H. (2019). Understanding the Correlation between Institutional Characteristics and Academic Performance: A case of Undergraduate Medical Students at University of Zambia. Journal of Lexicography and Terminology, 3 (2), 96 – 116.
26. Daka, H., Namafe, C. M. and Katowa – Mukwato, P. (2019). Perspectives on Teaching Approaches and the Grade Point Average Attainment of Undergraduate Medical Students at University of Zambia. International Journal of Humanities Social Sciences and Education. Vol.6 (12), 75-82.
27. Davis EA, Hodgson Y, Macaulay JO. Engagement of students with lectures in biochemistry and pharmacology. Biochem Mol Biol Educ. 2012; 40:300-9.
28. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-339.
29. Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. Journal of Applied Social Psychology, 22(14), 1111- 1132.
30. Duffy, R. M., Guerandel, A., Casey, Lipsey, M. W., & Wilson, D. (2000). Practical meta-analysis. Thousand Oaks, CA: Sage.
31. Lanham, R. (2006). The Economics of Attention. Style and Substance in the Age of Information. Chicago: The University of Chicago Press.
32. Manovich, L. (2001). The Language of New Media. Cambridge: Massachusetts Institute of Technology.
33. Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). Classroom Instruction That Works: Research-Based Strategies For Increasing Student
34. Achievement. Alexandria, VA: Association for Supervision and Curriculum Development.
35. Mayer, R. E. (2005). Cognitive theory of multimedia learning. In R. E. Mayer (Ed.), The Cambridge handbook of multimedia learning (pp. 31e48). New York, NY:Cambridge University Press.
36. Mayer, R. E. (2009). Multimedia learning. New York, NY: Cambridge University Press.
37. Novak, J. D., & Gowin, D. B. (1984). Learning how to learn. NY: Cambridge University Press.
38. Nesbit, J. C., & Adesope, O. O. (2006). Learning with concept and knowledge maps: A meta-analysis. Review of Educational Research, 76(3), 413-448.
39. Nora Strasser. (2010). Using Prezi In Education. Educational Publishers LLP, 11(2), 95–98.
40. Northwest Center for Public Health. (2012). Effective Presentations A Toolkit for Engaging an Audience Developed by in partnership with The Network for Public Health Law. Retrieved from https://www.ag.ndsu.edu/evaluation/documents/effective-presentations-a-toolkit-for-engaging-an-audience
41. N.N. (2010). Learn Prezi. Retrieved from: http://ww.prezi.com/learn.
42. Paas, F., van Merrienboer, J., & Adam, J. (1994). Measurement of cognitive load in instructional research. Perceptual and Motor Skills, 79(1), 419-430.
43. Pajares, F. & Miller, M. D. (1995). Mathematics self-efficacy and mathematics outcomes: The need for specificity in assessment. Journal of Counselling Psychology, 42(2), 190-198.
44. Pajares, F. (1996). Self-efficacy beliefs in academic settings. Review of Educational Research, 66(4), 543-578.
45. Paraskeva F., Bouta, H. & Papagianni, A. (2008). Individual characteristics and computer self-efficacy in secondary education teachers to integrate technology in educational practice. Computers & Education, 50(3), 1084–1091.
46. Špernjak, A. (2014). Usefulness of Prezi and PowerPoint presentation. 2014 37th International Convention on Information and Communication Technology, Electronics and Microelectronics, MIPRO 2014 - Proceedings, (July), 762–764. http://doi.org/10.1109/MIPRO.2014.6859667
47. Teaching, E. (2007). The Journal of Effective Teaching. Online, 7(2), 36–50. Retrieved from http://uncw.edu/cte/et/
48. Thompson, B. D., Mcnutt, B., & Ky, C. L. (2009). Powerful & Effective Presentations : How to Avoid Death by PowerPoint Major Points of this Presentation Powerful & Effective Presentations : How to Avoid Death by PowerPoint, 1–4.