

EFFECT OF POWER POINT PRESENTATION ON THE ACHIEVEMENT OF PHYSICS STUDENTS IN COLLEGES OF EDUCATION, BORNO STATE, NIGERIA

AYODELE G. FASANYA (Ph.D)

DEPARTMENT OF PHYSICS, COLLEGE OF EDUCATION, WAKA-BIU
BORNO STATE, NIGERIA

fasanya798@gmail.com

08036524713

Abstract: The teachers' basic tools for displaying lectures are through chalkboards, bulletin boards, transparencies with an overhead projector and power point presentation. The effect of power point in teaching physics is continuously debated. However, both supporters and opponents have insufficient empirical evidence. The present study was then conducted to find out the effect of power point in teaching undergraduate physics students in Colleges of Education in Borno State. This study adopted quasi experimental, specifically pretest, posttest non-equivalent control design. Simple randomization was used to select one College of Education out of the three existing Colleges in the state. The population for the study comprised all the NCE II physics students in the three Colleges, while the sample size consisted of 43 NCE II students offering physics in the selected College of Education. The sample size was divided into two groups and a selected-content based lecture on Mechanics and Properties of Matter II (PHY 213) was delivered. For one group (Experimental), lecture was delivered using power point presentation, and for the other group (Control), lecture was delivered using tradition lecture method. The instrument used for data collection was Single-based Multiple Choice Questions (MCQs). One research question and one hypothesis guided the study. The hypothesis was tested at 0.05 level of significance. Statistical analysis was done using Mean, Standard deviation and student's t-test. The results showed that students who were taught using tradition lecture (TL) method achieved significantly higher than their counterparts who were taught the same contents using power point presentation (PPP). Based on the results, it was therefore, recommended that lecture method should be adopted to teach physics in Colleges of Education in Nigeria.

Keywords: Achievement, Lecture Method, Power Point Presentation.

1. INTRODUCTION

The 21st century is the century of society's movement towards knowledge centredness, knowledge sharing and evolution in basic concepts and dimensions of life, such as education and training. In the last 20 years, the application of various approaches, models and strategies to improve students' achievement through the presentation of visual information with lectures has gained prominence (Mojgan, Sanaz, Balaye & Rahim, 2016). To emphasize particular point, many lecturers use written materials presented on a chalk board, white board or by power point presentation (PPP) on computers. In fact, many Colleges and Universities have rooms or mobile carts that are equipped with technology that is required for any instructor to display information in this manner (Erdemir, 2011).

Power point connotes a software that has become a presentation staple in lecture rooms, conference rooms and through the application of computer-based training. It is applied in over 20 million presentations a day, and its software is on over 200 million computers worldwide (Alley & Neeley, 2005). In the submission of Amare (2006) power point was developed to improve learning by providing the means to develop presentations that are more structured and interesting to audiences. Researchers have examined the benefits that these types of presentations bring to various audiences. The results indicate that students prefer power point presentations to lecture method (Susskind, 2005; Gok & Silay, 2008).

Education is the most important sector for any nation. Education helps to build a healthy society. As there is rapid growth and involvement of technology in all sectors, the education system is not left out (Khan & Thube, 2019). The implication of this is that the tradition classroom is changing to technology classroom. Therefore, institutions are trying to improve their academic by imparting different teaching and learning methods. The educationists form decades are trying to find the better teaching and learning approach in the higher education system.

Numerous studies have been conducted to determine whether power point presentations (PPPs) affect students' achievement in physics instruction. Hill, Arford, Lubitow and Smollin (2012) found that power point has no major effect on students' performance in physics. In a similar study conducted by Nouri and Shahid (2005) power point has no effect on short-term or long-term memory of lecture content. In the submission of Amare (2006), students learn more in lecture method. Vamshi, VishnuDatta, Kishan, Aditya and Bhanuprakash (2012) conducted a survey study on the teaching effectiveness of Chalk and talk (lecture method) and power point presentation and found that power point did not enhance the students' achievement in undergraduate classes. Kedare, Kharat and Wagh (2019) found that the tradition lecture method of teaching was more reliable in teaching and learning of physiotherapy undergraduates than power point presentation. On the contrary, Erdemir (2011) found that the physics students who were taught physics using power point were more successful than those in tradition lectures. Similarly, Thube and Shaligram (2007) found that power point helped students understand optics concepts easily than lecture method. Chopra et al (2014) conducted a study on teaching anatomy and found that students preferred combination tradition lecture method and power point presentation. All these studies were conducted in foreign countries. The present study was conducted in Borno State, Nigeria.

In general, physics lessons are taught in a traditional manner within the classroom setting because of the nature of physics topics and depending on the students' habits. To be successful in physics course, students should possess a good cognitive understanding ability, interpretation skill, mathematics knowledge and imagination. Therefore, the physics is perceived as being quite difficult in Nigeria. The reason why such a perception is true is that the subject may be taught in a way that fails to correspond to the nature of physics and the students' perceptions thereby disregarding the need to highlight and mentally combine visual and verbal knowledge (Erdemir, 2011). The present study addressed the following research question and hypothesis

Research Question: What are the pretest and posttest physics achievement mean scores of the NCE II students exposed to power point presentation and those exposed to tradition lecture method?

Hypothesis: There is no significant difference between the posttest physics achievement mean scores of the NCE II students exposed to power point presentation and tradition lecture method.

2. METHODOLOGY

This study adopted quasi-experimental research design, specifically, the pretest-posttest non-equivalent control group. There were two groups for the study; experimental group and control group. The experimental group was exposed to power point presentation, while the control group was exposed to the tradition lecture method. A pretest was administered on the two groups using the MCQs. Thereafter, the experimental group was exposed to PPP, while the control group was exposed to tradition lecture method. The exercise lasted for five weeks during the first semester of 2018/2019 session. The posttest was then administered on both groups using the same MCQs with the numbering of items modified to avoid direct answers.

The population for this study consisted of 118 NCE II students offering physics courses in the three Colleges of Education in the state. The sample comprised of 43 NCE II physics students in the only selected College of Education for the study. Single-based Multiple Choice Questions (MCQs) structured from Mechanics and Properties of Matter II (PHY 213) was used for data collection. The instrument was developed by the researcher and validated by an expert in the field of physics. The internal consistency of the instrument using Kuder-Richardson (KR-20) was found to be 0.78. The MCQs

consisted of 25 items with four options A to D with only one correct option. Each question carries 2 marks. The instrument was used for pretest as well as posttest.

3. RESULTS

Research Question: What are the pretest and posttest physics achievement mean scores of the NCE II students exposed to power point presentation and those exposed to tradition lecture method? The results were presented in Table 1

Table 1: Physics Students' Achievement Mean Scores Before and After Exposure to Power Point Presentation and Tradition Lecture Method.

Teaching method	N	Pretest		Posttest		Mean Difference
		Mean	SD	Mean	SD	
PPP (Exptal)	18	3.58	1.94	3.04	1.54	-0.54
TL Control)	25	4.49	2.25	2.58	2.38	1.09

The analysis in Table 1 revealed the achievement mean scores of students exposed to PPP and those exposed to TL. From the Table, it was shown that before exposure to the teaching methods, achievement mean scores of 3.58 and 4.49 with standard deviations of 1.94 and 2.25 were recorded for both experimental and control groups. The Table further showed that after exposure of the groups to the teaching methods, achievement mean scores of 3.04 and 5.58 with standard deviations of 1.54 and 2.38 were recorded for experimental and control groups respectively. The results showed that the students in the control group had a higher achievement in physics (mean difference = 2.54) than their counterparts in the PPP group. This implies that tradition lecture method was more effective in enhancing students' achievement in the selected physics course.

Table 2: t-test Analysis of Posttest Achievement Mean Scores of NCE II Students in Experimental and Control Groups.

Test	Group	N	Mean	SD	df	t _{cal}	P-Value (2tailed)
Posttest	Exptal (PPP)	18	3.04	1.54	41	4.33	0.000
	Control (TL)	25	5.58	2.38			

P < 0.05; Significant, Exptal: Experimental

The analysis in Table 2 indicated that P-value of 0.000 is less than the significant value set at 0.05 at df = 41. Since the P-value is in the critical region of rejection (P < 0.05), then the null hypothesis was rejected. This implies that there was a significant difference between the posttest achievement mean scores of NCE II students exposed to power point presentation and those exposed to tradition lecture method.

4. DISCUSSION

The purpose of this study was to investigate whether the use of power point presentation would enhance the achievement of NCE II students in Mechanics and Properties of Matter II (PHY 213). The results in Table 1 showed that the students exposed to tradition lecture method had a higher achievement than those exposed to power point presentation. The results were further subjected to statistical analysis in Table 2. From the analysis in Table 2, the P-value of 0.000 is less than the significant level set at 0.05. Therefore, the null hypothesis was rejected and the alternative one upheld. That is, a significant difference exists between the achievement mean scores of students taught PHY 213 using power point presentation and those taught the same contents using tradition lecture method. The tradition lecture method was more effective in enhancing students' achievement in physics. The result is in consonant with that of Amare (2006), Hill et al (2012), Vamshi et al (2012) and Kedare et al (2019) who found that students learn more in lecture method than in power point presentation. The result is however, in contrast to that of Erdemir (2011) who found that the use of power point presentation enhanced students' achievement in physics course.

5. CONCLUSION

In the present study, tradition lecture method is preferable to power point presentation in the teaching and learning of Mechanics and Properties of Matter II (PHY 213).

6. RECOMMENDATION

Based on the findings of the study, it is therefore, recommended that the use of tradition lecture method should be reinforced and be adopted in the teaching and learning of physics courses in the Universities, Polytechnics or Monotechnics and Colleges of Education in Nigeria.

REFERENCES

- [1] Alley, M., & Neeley, K. (2005). *Discovering the power point: rethinking the design of presentation slides from skillful user's perspective*. Proceedings of the 2005 American society of engineering education annual conference and exposition, Portland, Oregon. June 12-15.
- [2] Amare, N. (2006). To slideware or not to slideware: students' experiences with power point versus lecture method. *Journal of Technical Writing and Communication*, 36 (3), 297-308
- [3] Chopra, J., Rani, A., Archana, R., Deewan, R. K., Srivastava, A. K., & Sharma, P. K. (2014). Students' reflections on teaching methodology in anatomy. *Asian Journal of Medical Sciences*, 5 231-239.
- [4] Erdemir, N. (2011). Effect of power point and traditional lecture on students' achievement in physics. *Journal of Turkish Science Education*, 8 (3), 176-189.
- [5] Gok, T., & Silay, I. (2008). Effect of problem-solving strategies on problem-solving attitudes of cooperative learning groups in physics education. *Journal of Theory and Practice in Education*, 4 (2), 253-266.
- [6] Hill, A., Arford, T., Lubitow, A., & Smollin, L. (2012). I'm ambivalent about it: dilemmas of power point. *Teaching Sociology*, 40 (3), 242-256.
- [7] Kedare, R. V., Kharat, R. D., & Wagh, R. J. (2019). Impact of power point and chalkboard teaching in physiotherapy undergraduates. *International Journal of Clinical Biomedical Research*, 5 (1), 9-11
- [8] Khan, M. R., & Thube, S. G. (2019). A study on the preference for teaching methods by undergraduate science students. *Journal of Emerging Technologies and Innovative Research*, 6 (3), 502-506.
- [9] Mojgan, M., Sanaz, Z., Balaye, J., & Rahim, M. (2016). Comparison of e-learning and the classroom lecture in microbiology course based on Gagne's instructional model. *Research and Development in Medical Education*, 5 (1), 42-48.
- [10] Nouri, H., & Shahid, A. (2005). Effect of power point presentation on students' learning and attitudes. *Global Perspectives on Accounting Education*, 2, 53-73.
- [11] Susskind, J. E. (2005). Power point in the classroom: enhancing students' self-efficacy and attitudes. *Computers and Education*, 45 (2), 203-215.
- [12] Thube, S. G., & Shaligram, A. D. (2007). Effectiveness of computer assisted teaching of geometrical optics at undergraduate level. *Physics Education*, 1, 263-271
- [13] Vamshi, K. T., VishnuDatta Y. S., Kishan, S., Aditya, G., & Bhanuprakash, G. (2012). Comparative study on the teaching effectiveness of chalk and talk and Microsoft power point presentation from students' perspective. *International Journal of Pharmaceutical Sciences*, 4 (1), 191-193.