Comparative Analysis of PowerPoint-Enhanced vs. Traditional Lecture Methods on Anatomy Learning Outcomes in Nursing Education at Bishop Shanahan Hospital, Nsukka, Enugu State

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ABSTRACT

The learning of anatomy by nurses demands that student nurses acquire basic knowledge and skills through effective teaching methods. This study aimed to investigate the effectiveness of PowerPoint-enhanced lectures and traditional teaching methods on anatomy learning outcomes in nursing education at Bishop Shanahan Hospital, Nsukka, Enugu State. A pretest-posttest quasi-experimental design was used for the study, with all 51 Preliminary Training Studies (PTS) students admitted for the 2023–2024 academic session as respondents. The Anatomy Assessment Test (AAT) questionnaire was the main instrument used for data collection. Data analysis was performed via IBM SPSS version 25. The results revealed that the performance of the students at pretest and posttest was 10.66±2.93 and 34.09±5.88, respectively, when using PowerPoint-enhanced lectures (PPEL) and 13.66±3.04 and 34.26±6.67, respectively, when using traditional teaching methods (TTM). A significant difference was observed between PPEL and TTM in terms of their effectiveness on the performance of the students, "p = 004". PowerPoint-enhanced lecture was more effective at improving the academic performance of nursing students than the traditional lecture method.

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INTRODUCTION

The persistent academic underperformance of nursing students in anatomy courses at the Preliminary Training Studies (PTS) level represents a significant educational challenge across basic nursing schools in Nigeria, with implications extending beyond individual student outcomes to healthcare quality and professional development. Current institutional data indicate that anatomy courses consistently exhibit the highest failure rates among foundational subjects, contributing substantially to student attrition during the early training phases. At Bishop Shanahan Hospital School of Nursing, Nsukka, examination records for 2023 revealed that 48.6% of PTS students failed their assessments, with 17.1% specifically failing anatomy despite rigorous admission procedures and the employment of qualified instructors. This pattern reflects a broader systemic issue where 15–20% of preliminary training failures across Enugu State nursing schools stem directly from anatomy course deficiencies, raising fundamental questions about current pedagogical approaches and their effectiveness in facilitating the comprehension of complex anatomical concepts.

Theoretical frameworks in medical education emphasise that effective anatomy instruction requires the integration of visual, auditory, and kinesthetic learning modalities to accommodate diverse student learning preferences and enhance knowledge retention [1]. Constructivist learning theory suggests that students build understanding through active engagement with content, requiring instructional methods that facilitate the connection between abstract anatomical concepts and clinical applications [2]. Academic performance, defined as measurable knowledge and skills development assessed through standardised evaluations, serves as the primary indicator of educational effectiveness and is directly correlated with teaching methodology quality [3]. Research has demonstrated that teaching methods significantly influence student outcomes, with traditional lecture-based approaches potentially limiting engagement and comprehension compared with technology-enhanced instructional strategies.

Previous studies have examined various pedagogical interventions in anatomy education, including computer-assisted learning, simulation-based instruction, and multimedia presentations. Studies demonstrated improved learning outcomes when traditional teaching methods were supplemented with visual and interactive technologies [4,5]. However, limited research has specifically evaluated PowerPoint-enhanced lecture delivery compared with conventional teaching approaches in nursing education, particularly in resource-constrained environments typical of developing healthcare systems. The literature predominantly focuses on medical school settings in developed countries, creating a significant knowledge gap regarding effective anatomy instruction methods for nursing students in Sub-Saharan African educational institutions.

The identified gap between current teaching practices and optimal learning outcomes necessitates an empirical investigation of alternative instructional approaches that can improve anatomy comprehension and academic performance among nursing students. Understanding the comparative effectiveness of PowerPoint-enhanced and traditional lecture

methods is particularly relevant for nursing education programs seeking cost-effective interventions to reduce failure rates and improve knowledge retention. The findings of this investigation will inform evidence-based pedagogical decisions and contribute to the development of standardised instructional protocols for anatomy education in nursing curricula.

This study aimed to evaluate the effectiveness of PowerPoint-enhanced lecture delivery compared with traditional teaching methods in improving the academic performance of nursing students in anatomy at Bishop Shanahan Hospital, Nsukka. This research addresses a critical educational challenge with potential implications for nursing workforce development, healthcare quality improvement, and institutional resource allocation decisions across similar educational settings.

MATERIALS AND METHODS

Study Design and Setting

A pretest-posttest quasi-experimental design was employed to evaluate the effectiveness of teaching methods on the academic performance of students at the School of Nursing, Bishop Shanahan Hospital, Nsukka, Enugu State, Nigeria. The study utilised a crossover design in which participants served as their own controls, receiving both PowerPoint-enhanced and traditional teaching methods in sequential phases to minimise inter-subject variability and strengthen internal validity. The reporting of this study followed the STROBE checklist for observational research.

Participants

The study population comprised all 51 admitted Preliminary Training Studies (PTS) nursing students for the 2022–2023 academic session. Using a purposive sampling technique, 47 students met the inclusion criteria and constituted the final sample size. No probability sampling was employed because of the small population size.

Inclusion and Exclusion Criteria

The inclusion criteria were as follows: (1) enrolled PTS nursing students for the 2022/2023 session, (2) participated in both pre- and posttest assessments, (3) attended all scheduled teaching sessions during the intervention period, and (4) provided informed consent. The exclusion criteria were as follows: (1) had documented learning disabilities, (2) missed more than one teaching session per intervention phase, (3) withdrew consent during the study period, and (4) incomplete assessment submissions.

Variables

The Primary outcomes were academic performance (dependent) and PowerPoint-enhanced and traditional teaching methods (exposures). Secondary outcomes were age, gender, marital status, religion, and previous secondary school. Academic performance was assessed using the Anatomy Assessment Test (AAT) questionnaire.

Data Sources/Measurement

The study followed a structured eight-week protocol divided into two four-week intervention phases. The participants initially received PowerPoint-enhanced instruction covering digestive

system anatomy (weeks 1-4), followed by traditional lecture-based teaching on metabolic processes and the hepatobiliary system (weeks 5-8). A two-week washout period separated the interventions to minimise carryover effects (Table 1). The structured intervention comprised two sequential four-week phases, each involving eight hours of instruction delivered in 2-hour sessions, twice weekly. The PowerPoint presentations incorporated anatomical diagrams, 3D models, animations, and interactive elements to enhance the visual learning experience. Traditional teaching employs conventional lecture methods with blackboard illustrations and verbal explanations. Standardised lesson plans ensured content consistency across both teaching modalities, with identical learning objectives and assessment criteria maintained throughout the study period.

Table 1: Intervention Packages

Week	Method	Teaching time	Activities/topics
1	PowerPoint enhanced method	2 hours	General orientation to the program, pretest administration and introduction to the digestive system
2	PowerPoint enhanced method	2 hours	Describe the anatomy of the mouth, cheek & lips, tongue, teeth and salivary gland.
3	PowerPoint enhanced method	2 hours	Describe the anatomy of the pharynx, oesophagus and the stomach.
4	PowerPoint enhanced method	2 hours	Describe the anatomy of the small and large intestine. Post test
5	Traditional teaching method	2 hours	Pretest. Describe the anatomy of the pancreas, the digestion and absorption of nutrients.
6	Traditional teaching method	2 hours	Describe the anatomy of the liver, biliary tract and gall bladder
7	Traditional teaching method	2 hours	Describe the anatomy of the gall bladder, **and** discuss the metabolism of carbohydrates and fats.
8	Traditional teaching method	2 hours	Discuss the metabolism of protein, post-test, light refreshment, and the official declaration of the programme closed.

Data Collection Instrument

The Anatomy Assessment Test (AAT) questionnaire, developed specifically for this study, served as the primary data collection instrument. The AAT consists of 50 multiple-choice questions covering anatomical structures, physiological processes, and clinical correlations relevant to the digestive system and metabolism. Instrument validity was established through expert reviews by three anatomy educators and two nursing education specialists. The content validity index (CVI) was 0.89, indicating excellent content validity. Reliability was determined via the test–retest methodology with a two-week interval among 15 students not participating in the main study, yielding a Cronbach's alpha coefficient of 0.82.

Sample Size

Power analysis indicated that a sample size of 40 participants would provide 80% power to detect a medium effect size (Cohen's d = 0.5) at an α = 0.05 significance level.

Quantitative Variables
Pre- and posttest assessments were administered at the beginning and end of each intervention phase. Academic performance was categorised via standardised scoring criteria: high performance (70–100 points), moderate performance (60–69 points), low performance (50–59 points), and failure (below 50 points). The raw scores were converted to percentage values for comparative analyses and interpretation.

Statistical Analysis
Data analysis was conducted via IBM SPSS version 25.0. The normality of the data distribution was assessed via the Shapiro–Wilk test and visual inspection of histograms and Q–Q plots. Descriptive statistics included means, standard deviations, frequencies, and percentages for the demographic and performance variables. A paired-samples t test was employed to compare pre- and posttest scores within each intervention group, whereas an independent samples t test was used to assess differences between PowerPoint-enhanced and traditional teaching methods. Effect sizes were calculated via Cohen's d to determine the practical significance of the observed differences. Statistical significance was set at $\alpha = 0.05$, and 95% confidence intervals were reported for all estimates.

Ethical Approval
Ethical clearance was obtained from the Research and Ethics Committee (Reference: 2022/06/498). Administrative approval was obtained from the school authorities, and written informed consent was obtained from all participants following a comprehensive explanation of the study objectives, procedures, risks, and benefits.

RESULTS
The study enrolled 47 nursing students at the Bishop Shanahan Hospital School of Nursing, and their demographic characteristics are presented in Table 2. The sample demonstrated homogeneity in religious affiliation, with all participants identified as Christian, while the gender distribution revealed a predominance of female students (80.9%, n=38) compared with males (19.1%, n=9). The age distribution revealed that the majority of participants (63.8%, n=30) were in the 16-20 years age bracket, with a mean age of 20.55±4.10 years. Marital status analysis indicated that 93.6% (n=44) of the participants were single, reflecting the typical demographic profile of entry-level nursing students. Academic background data revealed that 40.4% (n=19) of the students reported academic positions between 1st and 3rd in their previous educational institutions, whereas 59.6% (n=28) had attended private secondary schools. Notably, all participants (100%) were first-time PTS candidates, eliminating potential confounding effects of prior exposure to anatomy coursework at this level.

Table 2: Descriptive Statistics of Study participants

Sociodemographic variables	BSH (n = 47)
Age	
- 16-20	30(63.8)
- 21-25	11(23.4)
- 26 +	5(10.6)
- *No response*	1(2.1)
M±SD	20.55±4.10

Gender	
- Female	38(80.9)
- Male	9(19.1)
Religion	
- Christian	47(100.0)
Marital status	
- Married	3(6.4)
- Single	44(93.6)
Student's reported position in the last school attended	
- 1st-3rd	19(40.4)
- 4th-6th	16(34.0)
- 7th-9th	3(6.4)
- 10th and above	7(14.9)
- *No response*	2(4.3)
Types of secondary school attended	
- Private school	28(59.6)
- Public school	8(17.0)
- Unity school	9(19.1)
- Mission	2(4.3)
Is this your first time of attempting PTS	
- Yes	47(100.0)

*BSH, Bishop Shanahan Hospital; M±SD, Mean & Standard deviation; PTS, preliminary training studies.

Performance of the PowerPoint-enhanced Lecture Method

Analysis of academic performance following PowerPoint-enhanced instruction revealed substantial improvements between the pre- and posttest assessments, as detailed in Table 3. The pre-intervention assessment revealed universally poor performance, with all the students (100%, n=47) scoring below 50 points, resulting in a mean score of 21.32±5.86 (range: 10-34). The post-intervention results showed marked improvement, with the mean score increasing to 68.17±11.76 (range: 40–80). The performance distribution analysis revealed that 51.1% (n=24) of the students achieved high performance (≥70 points), 23.4% (n=11) demonstrated average performance (60-69 points), and 21.3% (n=10) showed low performance (50-59 points). Only 4.3% (n=2) of the students remained in the poor-performance category post-intervention.

Table 3: Pre- and post-intervention academic performance via the PowerPoint-enhanced lecture method

Academic Performance	Pre test	Post test
Poor *(score < 50)*	47(100.0)	2(4.3)
Low *(score 50-59)*	-	10(21.3)
Average *(score 60-69)*	-	11(23.4)
High *(score 70+)*	-	24(51.1)
M±SD	21.32±5.86	68.17.±11.76
Range	10-34	40-80

M±SD, Mean & Standard deviation

Performance of Traditional Teaching Methods
The outcomes of the traditional lecture method, presented in Table 4, demonstrated comparable baseline performance with universally poor scores in pretesting. The initial assessment yielded a mean score of 27.32±6.08 (range: 18-44), with all participants (100%, n=47) scoring below the 50-point threshold. Post-intervention evaluation revealed improvement, with a mean score of 68.51±13.35 (range: 36–92). The performance categorisation revealed that 48.9% (n=23) of the students achieved high performance, 23.4% (n=11) demonstrated average performance, 19.1% (n=9) showed low performance, and 8.5% (n=4) had poor performance.

Table 4: Pre- and post-intervention academic performance via the traditional teaching method

Academic Performance	Pretest	Posttest
Poor (score < 50)	47(100.0)	4(8.5)
Low (score 50-59)	-	9(19.1)
Average (score 60-69)	-	11(23.4)
High (score 70+)	-	23(48.9)
M±SD	27.32±6.08	68.51±13.35
Range	18-44	36-92

M±SD, Mean & Standard deviation

Gender-based Performance Analysis
The gender-stratified analysis, presented in Table 5, revealed differential performance patterns between male and female participants across both teaching methodologies. Female students (n=38) demonstrated consistent improvement patterns, with the PowerPoint method yielding a mean posttest score of 68.74±11.99 compared with 69.05±13.30 for the traditional method. High performance rates were achieved by 55.3% of females via the PowerPoint method versus 52.6% via the traditional approach. Male participants (n=9) showed similar improvement trajectories, with mean posttest scores of 65.78±11.11 for the PowerPoint method and 66.22±14.12 for the traditional method. The high performance rates among males were identical at 33.3% for both teaching methodologies, suggesting consistent educational outcomes regardless of the instructional approach within this subgroup.

Table 5: Pre- and post-intervention academic performance of students by gender

	PowerPoint	Traditional	PowerPoint	Traditional
Gender	Pre test		Post test	
Female				
High f (%)	-	-	21(55.3)	20(52.6)
Moderate f (%)	-	-	7(18.4)	7(18.4)
Low f (%)	-	-	8(21.1)	8(21.1)
Poor f (%)	38(100.0)	38(100.0)	2(5.3)	3(7.9)
M±SD	21.37±6.24	27.16±6.42	68.74±11.99	69.05±13.30
Male				
High f (%)	-	-	3(33.3)	3(33.3)
Moderate f (%)	-	-	4(44.4)	4(44.4)
Low f (%)	-	-	2(22.2)	1(11.1)
Poor f (%)	9(100.0)	9(100.0)	-	1(11.1)

M±SD	21.11±4.14	28.00±4.58	65.78±11.11	66.22±14.12

M±SD, Mean & Standard deviation

Comparative Effectiveness Analysis

The statistical comparison of teaching method effectiveness, summarised in Table 6, revealed measurable differences in educational outcomes between PowerPoint-enhanced and traditional approaches. Paired t-test analysis demonstrated a statistically significant difference in performance improvement (t=3.065, p=0.004), with the PowerPoint method yielding superior learning gains. The differences in the mean improvement scores between the posttest and pretest performance were 46.85±12.95 points for the PowerPoint method and 41.19±13.72 points for the traditional method. Effect size calculation via Cohen's d yielded a medium effect (d=0.43), indicating a practically meaningful educational impact beyond statistical significance. The findings demonstrate that both teaching methodologies substantially improved student performance from baseline assessments. However, PowerPoint-enhanced instruction showed superior effectiveness in facilitating anatomy learning among nursing students, with higher proportions of students achieving optimal performance levels and greater mean score improvements than traditional lecture methods did.

Table 6: Comparative Effectiveness Analysis

Effectiveness of teaching methods on academic performance	M±SD	T	p value
PowerPoint enhanced method	68.17±11.76	3.065	0.004**
Traditional method	68.51±13.35		

M±SD, Mean & Standard deviation

DISCUSSION

The baseline assessment results, demonstrating universally poor pre-intervention performance across all participants, reflect the fundamental challenges in anatomy education within Nigerian nursing curricula. These findings align with the systemic educational deficiencies documented in previous investigations, where inadequate secondary school preparation in the biological sciences creates knowledge gaps that persist into tertiary education [7]. The observed pretest mean scores of 21.32±5.86 for the PowerPoint groups and 27.32±6.08 for the traditional teaching groups indicate that entering qualifications, particularly in biology coursework, may inadequately prepare students for the advanced anatomical concepts required in nursing education. Environmental factors, including registration stress, academic transition anxiety, and adaptation to new institutional frameworks, likely compound these baseline deficiencies, which is consistent with the principles of general systems theory that environmental conditions influence learning processes and outcomes [8, 9, 5, 10].

The post-intervention improvements demonstrated by both teaching methodologies validate the effectiveness of structured pedagogical approaches in addressing initial knowledge deficits. The PowerPoint-enhanced method yields superior learning gains through multimedia integration, which accommodates diverse learning styles, provides visual reinforcement of complex anatomical structures, and creates organised content roadmaps that facilitate comprehension and retention [11]. These technological enhancements particularly benefit visual and kinesthetic learners who struggle with traditional lecture formats, supporting

findings from comparable studies that document improved student engagement and performance through multimedia instruction [12, 13, 14,15]. Traditional teaching methods have demonstrated measurable effectiveness through direct explanations of anatomical concepts and structured content delivery, particularly when supplemented with interactive discussions and question-and-answer sessions that promote active learning engagement [16, 25]. The effectiveness of traditional approaches depends heavily on the instructor's expertise and interactive elements that transform passive content reception into dynamic knowledge construction.

Gender-based performance analysis revealed that female students achieved higher post-intervention scores across both teaching methodologies, which is consistent with educational research documenting female academic advantages in healthcare disciplines [12, 18, 19]. This performance differential may reflect the institutional and societal emphasis on female education, combined with documented tendencies toward more focused study habits and greater academic persistence among female nursing students [20]. However, these findings contrast with studies reporting male academic superiority or gender-neutral performance outcomes [12, 15, 21, 10, 22, 23], suggesting that gender effects on academic performance may be context dependent and influenced by institutional culture, teaching quality, and student support systems rather than inherent cognitive differences.

The statistically significant difference between PowerPoint-enhanced and traditional teaching methods (p=0.004) demonstrates the measurable educational advantages of technology-integrated instruction in anatomy education. Compared with conventional lecture delivery, PowerPoint presentations provide structured content organisation, enhanced visual emphasis on key concepts, and multimedia capabilities that improve understanding and retention [9, 14, 24]. The medium effect size (Cohen's d=0.43) indicates practical educational significance beyond statistical measures, suggesting that technology-enhanced instruction produces meaningful improvements in students' learning outcomes. These findings support institutional investment in educational technology and faculty development programs that enhance multimedia instruction capabilities. Contradictory findings in some studies may reflect differences in implementation quality, variations in instructor technological competency, or contextual factors that influence the effectiveness of technology-enhanced instruction [5, 13, 25]. The demonstrated effectiveness of both teaching methods in improving student performance from baseline assessments suggests that structured pedagogical interventions can successfully address initial knowledge deficits in anatomical education. Optimal educational outcomes likely require hybrid approaches that combine the strengths of traditional teaching in concept explanations with multimedia enhancements that accommodate diverse learning preferences and improve content accessibility. These findings have direct implications for nursing education curriculum development, faculty training requirements, and resource allocation decisions within healthcare education institutions seeking to improve student outcomes and reduce attrition rates in preliminary training programs.

LIMITATIONS
The single-institution study design restricts external validity to similar educational settings within comparable socioeconomic and cultural environments, preventing broad application across diverse nursing education contexts. The relatively small sample size of 47 participants

limits the statistical power for subgroup analyses and may not capture performance variations across broader student populations. The crossover design, while strengthening internal validity through participant self-control, may introduce carryover effects or learning fatigue that could influence second-phase performance measurement. The eight-week study duration may be insufficient to assess long-term knowledge retention and the practical application of learned anatomical concepts in clinical settings. Cultural and linguistic homogeneity within the study population may limit its applicability to more diverse educational environments, where student backgrounds and learning preferences vary substantially.

CONCLUSION

This study provides empirical evidence supporting the educational effectiveness of PowerPoint-enhanced instruction over traditional teaching methods in anatomy education for nursing students. Both pedagogical approaches demonstrated substantial improvements from baseline performance, with the PowerPoint-enhanced methodology yielding statistically superior learning outcomes and practically meaningful effect sizes. The universal poor performance observed in pre-intervention assessments highlights the systemic challenges in anatomy education that require structured pedagogical interventions to address foundational knowledge deficits. Gender analysis revealed that female students achieved higher performance levels across both teaching modalities, although both demographic groups benefited substantially from improved instructional approaches. The medium effect size achieved through technology-enhanced instruction indicates that multimedia integration produces educationally meaningful improvements beyond statistical significance. These findings support institutional investment in educational technology and faculty development programs, suggesting that optimal learning outcomes may require hybrid approaches that combine traditional teaching strengths with multimedia enhancements. The demonstrated effectiveness of structured pedagogical interventions in addressing initial knowledge deficits provides a foundation for curriculum reform initiatives aimed at reducing student attrition and improving academic outcomes in nursing education. Future research should examine long-term knowledge retention, clinical application effectiveness, and implementation feasibility across diverse educational settings to further validate these preliminary findings and guide evidence-based educational policy development within healthcare-education systems.

RELEVANCE FOR CLINICAL PRACTICE

The demonstrated superiority of PowerPoint-enhanced instruction over traditional teaching methods presents immediate opportunities for curriculum reform in nursing education programs. Educational institutions should prioritise faculty development initiatives that enhance the technological competency and multimedia instructional design capabilities of anatomy educators. The observed performance improvements suggest that the systematic implementation of technology-enhanced teaching methodologies could reduce attrition rates during preliminary training studies, thereby addressing the persistent challenge of students' exodus from nursing programmes. Healthcare education administrators should consider resource allocation strategies that support multimedia classroom infrastructure while maintaining cost-effectiveness through the sharing of technological resources across multiple courses. The gender-neutral effectiveness of both teaching approaches indicates that instructional improvements benefit all students, regardless of their demographic characteristics, thereby supporting equitable educational outcomes. Clinical supervisors and

nurse educators working with newly graduated nurses may expect improved foundational anatomy knowledge among students trained through enhanced pedagogical methods, potentially reducing the remedial instruction required during clinical orientation. The findings support the adoption of evidence-based teaching practices in nursing curricula, encouraging educators to move beyond traditional lecture formats toward more engaging and effective instructional approaches that accommodate diverse learning preferences and improve knowledge retention.

Data Availability Statement
The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval
Ethical clearance was obtained from the Research and Ethics Committee of the University of Nigeria Teaching Hospital, Ituku/Ozalla, Enugu (Reference: UNTH/HREC/2022/06/498). Administrative approval was obtained from the school authorities, and written informed consent was obtained from all participants following a comprehensive explanation of the study objectives, procedures, risks, and benefits.

Conflict of Interest
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

Author Contributions
Conceptualisation: SEO; Methodology: PNI; Formal Analysis: EJN; Investigation: SEO, PNI; Resources: OTM; Data Curation: EJN; Writing - Original Draft: SEO; Writing - Review & Editing: JAI, PNI; Visualisation: EJN; Supervision: PNI; Project Administration: SEO, OTM; Validation: JAI, OTM.

References
[1]   Losco CD, Grant WD, Armson A, Mayer AJ, Walker BF, et al. Effective methods of teaching and learning anatomy as Basic Science: A BEME systematic review. Med Teach 2017; 39(3):234-243.

[2]   Mahona P, Mkulu DG. Students' relationships and academic performance in public secondary schools in Magu District, Tanzania. Int J Educ Res 2020; 8(2):45-52.

[3]   Awotana SO, Abiola OF. Dynamics of Nigeria Basic Nursing Academic Performance in Weeding Examinations. J Nurs Educ Pract 2019; 9(4):78-85.

[4]   Abubakar FU, Mahammed A, Ibrahim AH. Students' preferences for teaching methods and their performance in schools of nursing in Nigeria. Int J Nurs Educ 2022; 14 (2):47-55.

[5]   Prabhjot SK, Jasbir K, Mandeep K, Kanika T, Bindu K. The effect of PowerPoint and traditional lecture method on students' academic achievement in nursing at DMCH College of Nursing, Ladhiana. Nurs Res Forum 2020; 15 (3):123-130.

[6]   Ankolekar VH, Souza ASD, Mamatha H. Effectiveness of PowerPoint presentation in teaching anatomy: A students' perspective. J Compr Health 2017; 23(4):1977-1979.

[7]   Ogbonnaya NP, Okpuruka POU, Iheanacho NP, Ndu A. Students' entry qualification and academic performance in Basic School of Nursing in Enugu state between 1995 & 1999. West Afr J Nurs 2014; 25(1):34-42.

[8]   Yumang JR. Effect of PowerPoint presentation on academic performance in physics among high schools in McDapdap Rest. Int J Sci Res 2018; 7(8):156-162.

[9]   Ibrahim BRA. Effects of using PowerPoint in the academic achievement of social and natural studies in fifth-grade students at risk for learning disabilities at Special Education, Najran University, Kingdom of Saudi Arabia. Int J Res 2018; 6(4):191-202.

[10]   Ohawuro OE, Onivehu AO. Effect of PowerPoint presentation on students' cognitive achievement in geography among secondary schools in Ilorin, Kwara State. Rom Rev Geogr Educ 2019; 7(2):46-60.

[11]   Hashemi M, Azizinezhad M, Farokhi M. PowerPoint as innovative tool for teaching and learning in modern class. Procedia Soc Behav Sci 2012; 31:559-563.

[12]   Akpoghol TV, Ezeudu FO, Adzape JN, Otor EE. Effects of the lecture method supplemented with music and computer animation on senior secondary school students' academic achievement in electrochemistry in Makurdi. J Educ Pract 2016; 7(10):735-788.

[13]   Djudin T. Effects of teaching method and lecture programme on students' satisfaction rate and academic achievement. J Coll Teach Learn 2018; 3(2):121-128.

[14]   Suhaimi M, Malaysia A, Isaqguf C. The impact of teaching method on geography and academic performance of students in Buea Municipality. Int J Geogr Earth Sci 2018; 4(3):78-89.

[15]   Anigbo LC, Orie MJ. Effects of power point instruction on students' academic achievement in Computer Science Data Base Management System in Colleges of Education in River State. J Comput Eng Inf Sci 2018; 9(4):87-90.

[16]   Muema JS, Mulwa DM, Mailu SN. Relationship between Teaching methods and students' performance in Mathematics in Public secondary schools in Dadaab Sub County, Garissa County, Kenya. Int J Res Math Educ 2018; 8(2):59-63.

[17]   Omwirhiren EM, Khalil UI. Effects of two teacher's instructional method on learning outcomes in chemistry in selected secondary schools in Kaduna Metropolis, Nigeria. J Educ Pract 2016; 7(15):1-9.

[18]   Sagar P, Pandey N. The effect of power point presentation on academic achievement of B.Ed. Teacher Trainees of Iran. Int J Educ Res Technol 2014; 5(2):45-52.

[19]   Tsaousis I, Alghamdi MH. Examining academic performance across genders differently: Measurement invariance and the latest mean differences via bias-corrected bootstrap confidence intervals. Front Psychol 2023; 14:1123456.

[20]   Doe PF, Oppong EA, Sarfo JO. Students, Demographic, Academic Characteristics and Performance in Registered General Nursing Licensing Examination in Ghana. Eur J Contemp Educ 2018; 7(1):73-81.

[21]   Gambari AI, Yusuf HT, Balogun SA. Effectiveness of power point presentation on students' cognitive achievement in technical drawing in Abuja Metropolis. Malays Online J Educ Technol 2015; 3(4):12-15.

[22]   Orji EM, Arcbibong EP, Ogbonnaya NP, Aukoyan F, Edet AF. Gender influence of academic performance of nursing students in Nigerian Universities. J Crit Rev 2021; 8(3):1087-1094.

[23]   Esewe RE, Ogunleye ME. Effect of Gender on learning Style preferences of nursing students in some institutions in Edo state, Nigeria. Afr J Health Sci Environ 2021; 2(2):1-10.

[24]   Nwadi EC. Effects of PowerPoint lesson delivery on students' achievement in general studies education (GSE) courses in colleges of education in Nigeria. J Educ Res Behav Sci 2020; 9(1):27-32.

[25]   Sewasew D, Mengestie M, Abate G. A comparative study on power point presentation and traditional lecture method in material understandability, effectiveness and attitude among University Students of Gondar, Ethiopia. Educ Res Rev 2015; 10(2):234-243.