

Assessment of medical students' perception of anatomical pathology teaching methods

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Abstract

Background: Anatomical pathology is an essential component of medical training in the 4th year of medical school and the learning process may be impacted by the effectiveness of delivery methods. This study aimed to assess the perception of medical students on the teaching methods in anatomical pathology.

Methods: A descriptive cross-sectional survey was conducted between January 2024 and January 2025 among medical students across four universities in Southern Nigeria: University of Port Harcourt, Bayelsa Medical University, Gregory University, and Niger Delta University. A structured questionnaire was used to collect data on attendance, preferences, and perceptions of different teaching methods. Responses were entered into Microsoft Excel and analysed in SPSS, applying descriptive statistics such as frequencies and percentages. Results were presented in tables and figures for clarity.

Results: A total of 215 students from four the medical schools responded to this study. The majority were in their 5th year of study. Lectures were the preferred teaching method (65.6%), followed by practical demonstrations (26%) and seminar (8.4%). Students rated the quality of pathology lectures as predominantly good. All the practical demonstration tools were said to make Anatomical pathology more understandable. Among interactive study methods, group discussion was the most preferred.

Conclusion: This study revealed a strong preference among medical students for lectures, practical sessions, as well as group discussions in learning Anatomical Pathology. These findings highlight the need for educators and medical education college boards to integrate and strengthen these interactive and hands-on teaching approaches within the anatomical pathology curriculum.

Keywords: Perception, anatomical pathology, lectures, teaching methods, medical students

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INTRODUCTION

Pathology is the study of functional and structural changes in cells, tissues and organs by examining the aetiology, pathogenesis, morphological changes and clinical presentation of the diseases process.¹ Anatomical pathology, a cornerstone of diagnostic medicine, plays a pivotal role in

clinical decision-making and the understanding of disease processes by the examination of surgically removed organs, tissues biopsies, bodily fluids, and, in some cases, the whole body (autopsy).^{1,2} In medical education, it is one of the four fundamental disciplines in Pathology that includes; Anatomical Pathology, Chemical Pathology, Haematology and Medical Microbiology.

Effective teaching methods in Anatomical Pathology are essential for medical students to develop a strong foundation in pathology and its clinical applications.³ However, medical students' perceptions of teaching methods can significantly impact their learning outcomes, motivation, and overall educational experience.⁴ In addition, opportunities to improve teaching effectiveness may be missed by relying on familiar teaching methods such as lectures.⁵

For medical students, mastering Anatomical Pathology is essential not only for examination purposes but also for developing critical clinical reasoning and diagnostic proficiency.⁶ However, teaching the course poses unique challenges due to its complex histological, gross morphological, and clinical correlations.⁷ These challenges have prompted educators to adopt various instructional methods, including didactic lectures⁸, problem-based learning (PBL),⁹ virtual microscopy,⁷ digital pathology platforms,¹⁰ team-based learning (TBL),¹¹ and case-based discussions.¹² In most medical schools, practical exercises are an integral part of pathology coursework, and assessing these practical exercises is important. The extensively applied Objective Structured Practical Examination (OSPE) is popularly used in assessing medical subjects.¹³ Other assessment methods include the Objective Structured Clinical Examination (OSCE), Essay questions, and Multiple-Choice Questions (MCQ).

The efficacy of these teaching methods is often judged through student perception, an essential yet underexplored parameter.¹⁴ Student perceptions influence engagement, motivation, and ultimately academic performance.¹⁵ Although numerous teaching approaches have been implemented, few studies in Nigeria have examined how medical students perceive their effectiveness, particularly in relation to learning outcomes and engagement^{16,17,18}. This represents a critical research gap in medical education. It is hypothesized that students' preferences for interactive and practical teaching methods are positively associated with higher engagement and improved performance in Anatomical Pathology. Hence, this study aims to evaluate medical students' perceptions of teaching methods in Anatomical Pathology, assessing the strengths, limitations,

and areas for improvement. The specific objectives were to determine students' attendance at different teaching sessions, assess their preferences for teaching methods and interactive study approaches, and assess the success rate of medical students in Anatomical pathology.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted on students from four randomly selected universities in South-South Nigeria, namely the University of Port Harcourt, Bayelsa Medical University, Gregory University, and Niger Delta University out of the fourteen medical colleges in the region. This was a one-year study carried out between January 2024 and January 2025.

A structured questionnaire was used to collect data on attendance, preferences, and perceptions of different teaching methods after obtaining consent from the students.

The inclusion criteria were students currently in the Anatomical Pathology class who had attempted a quiz/test, or students in Anatomical Pathology class who were repeating the year due to failure of the course or who have passed Anatomical Pathology and were now in higher classes.

Students who had not attempted any quiz in Anatomical Pathology, or are unwilling to participate in the study for any reason were exempted from the study.

Instrument development and validation

Data were collected using a structured, self-administered questionnaire developed by the researchers after reviewing relevant literature on medical education and teaching methods in pathology.^{3,5} The questionnaire consisted of sections on demographic characteristics, class attendance, preferred teaching methods, and perceptions of effectiveness. The instrument was pre-tested on some medical personnel not included in the study to assess clarity, reliability, and face validity. Minor adjustments were made based on feedback. After obtaining informed consent, questionnaires were distributed to eligible participants during class sessions and electronically via institutional mailing lists. Participation was voluntary and anonymous.

Data analysis

Data were analyzed using both descriptive and inferential statistics with IBM SPSS Statistics version 29 (IBM Corp., Armonk, N.Y., USA).

Descriptive statistics such as frequencies and percentages were used to summarize students' attendance levels, preferred learning methods, and performance outcomes.

To further explore relationships among variables, Chi-square (χ^2) tests and Pearson correlation analyses were employed.

Ethical clearance

Ethical Clearance was obtained from the Research and Ethics Committee of University of Port Harcourt.

RESULTS

A total of 215 responses were received, specifically; 83 students were from the University of Port Harcourt, 49 from Bayelsa Medical University, 34 from Gregory University, and 49 from Niger Delta University, as shown in Table 1. The females' students were 121 (56.3%) while males were 94 males (43.7%).

The students who partook in the survey were in 400, 500 and 600 level as seen in the Table 2 below with the highest number seen in 500 level.

Student attendance in Anatomical Pathology lectures, practicals, and seminar was assessed across three categories: below 50%, between 50–74%, and above 75%. Overall, most students maintained high attendance ($\geq 75\%$) in both lectures and practical sessions, while seminar attendance was comparatively lower as seen in Figure 1.

Preferences for the various teaching sessions (lectures, practical, and seminar) were evaluated to determine the most preferred among students. The students noted that

lecture was their most preferred teaching method (Figure 2). The students stated how the lectures impacted their interest in Anatomical Pathology with the majority saying that it made them ambivalent (Figure 3). However, the majority (47.9%) of the students said the delivery of the lecture was good (Figure 4), 36.3% said the lecture delivery was average, while 7.9% said it was excellent.

The students were asked about their perceptions of autopsy, slides, and pot demonstrations as regards their training. For the autopsy demonstration, 121 felt it made the course easier to understand and more interesting, 81 said it made no effect in their understanding of the course while 13 said it made it more uninteresting (Figure 5). Slide demonstration was helpful to 144 students, had no effect on 50 students and made 21 students uninterested in the course. Pot demonstration was helpful to 143 students, 58 said it made no difference to them while 14 said it made them more uninterested in the course.

The students were asked to select the most effective interactive teaching method from the following options: group discussions, role-play, simulations, case studies, hands-on activities, online lectures, and collaborative projects. They had the option of choosing more than one interactive teaching method. For group discussions, 132 felt it as useful 122 said case studies were helpful, 92 opted for hands-on activities while the least number of people (14 students) felt online lectures were helpful (Figure 6).

Among the students surveyed, most (166) had passed the Anatomical Pathology course and progressed to higher classes, while 44 were still enrolled, and 5 had yet to pass. Of those who had passed, the majority (150) succeeded on their first attempt, 14 after one resit, and 2 after a second resit. Among students who passed on their first attempt, most scored between 60–69%, indicating generally good academic performance.

Table 1: Nigerian universities participating in the study

Names of Schools	Number of Students	Percentage (%)
University of Port Harcourt	83	38.6
Bayelsa Medical University	49	22.7
Gregory University	34	15.8
Niger Delta University	49	22.7
Total	215	100

Table 2: Participants' distribution by levels of study

Level of students	Number of Students	Percentage
400 Level	44	20.5
500 Level	102	47.4
600 Level	69	32.1
Total	215	100

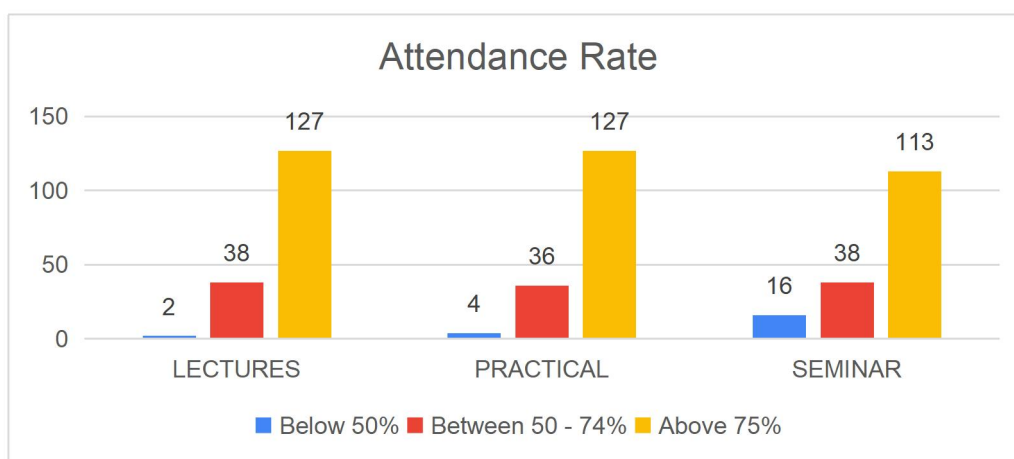


Figure 1: Graph showing attendance of students in anatomical pathology lectures, practical and seminar

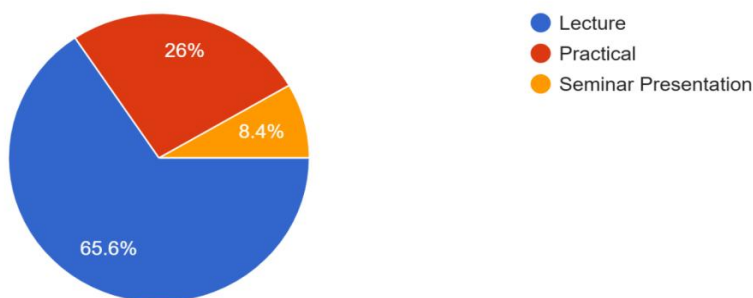


Figure 2: Distribution of preferred teaching methods

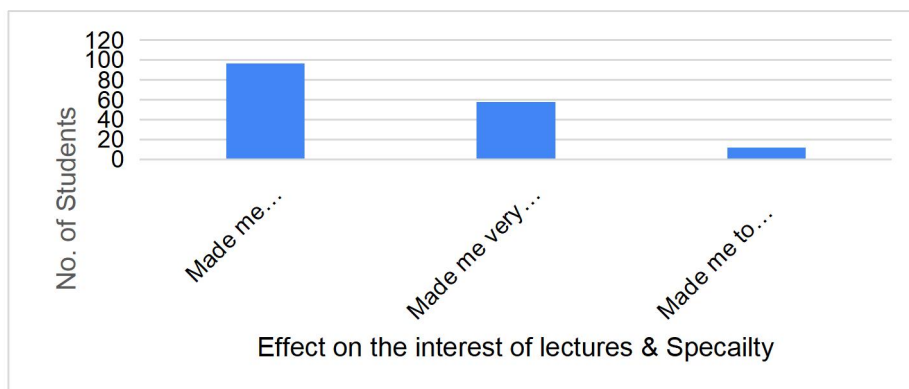


Figure 3: Effect of lecture delivery on students' interest in anatomical pathology

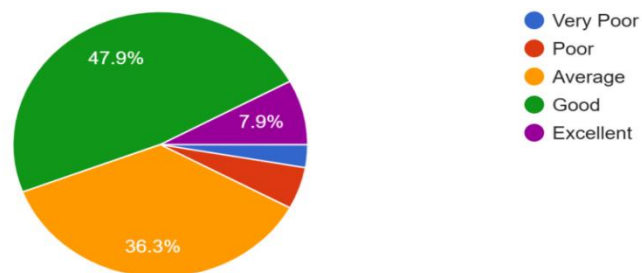


Figure 4: Chart showing anatomical pathology attendance rating

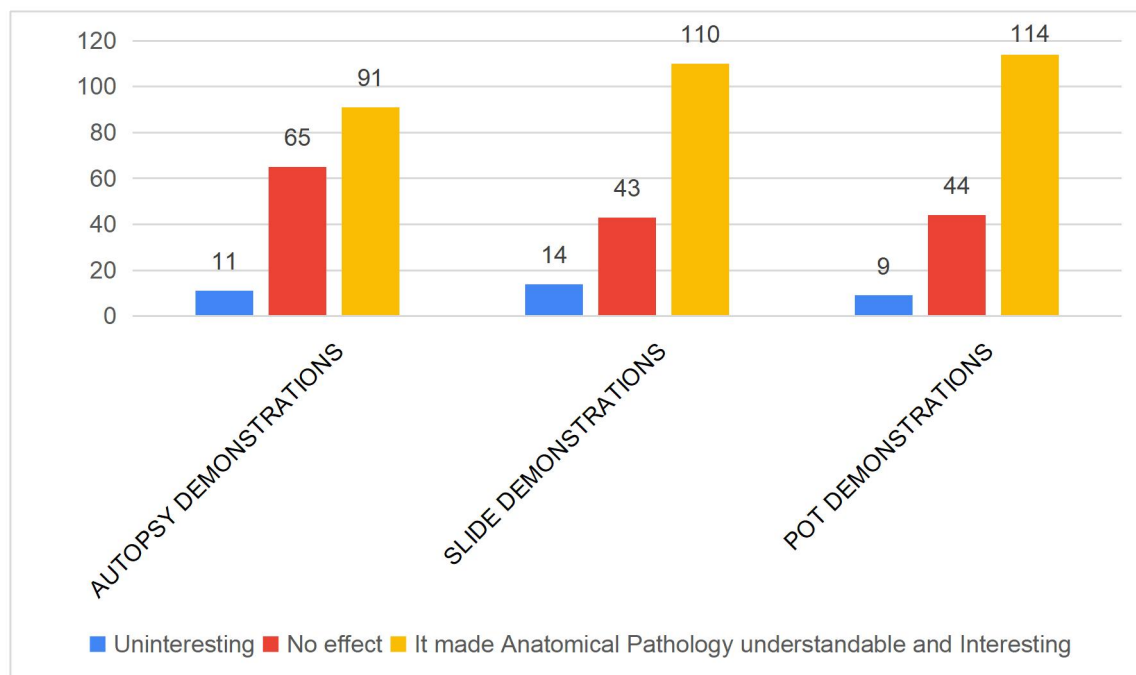


Figure 5: The perception of students about the various anatomical pathology practical demonstrations

What interactive teaching methods do you think are effective in learning Anatomical Pathology?
215 responses

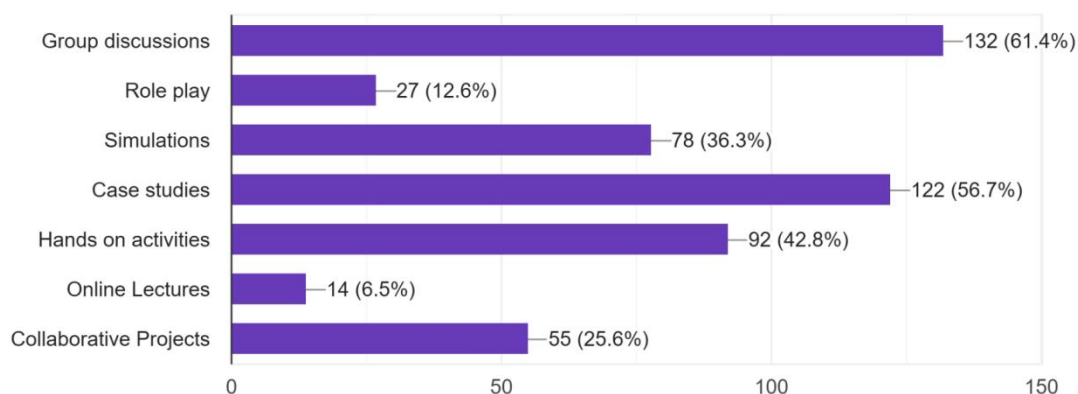


Figure 6: Interactive teaching methods and the most effective of them

Table 3: Summary of students' course status, exam attempts, and score distribution in anatomical pathology

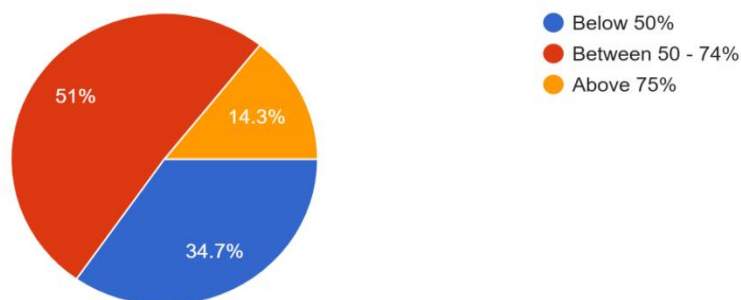
Lead Question	Responses	No. of participants (%)	Percentage
Have you passed the Anatomical Pathology exam?	Still in the class	44	20.5%
	Yes	166	77.2%
	No	5	2.3%
	Total	215	100%
Exam Performance	Passed on first attempt	150	90.4%
	Passed after first resit	14	8.4%
	Passed after second resit	2	1.2%
	Total	166	100%
Student score range (%)	50-59	64	
	60-69	65	
	70-79	16	
	80-89	4	
	90-100	1	

Inferential Analysis

Inferential statistics were applied to further explore relationships among key variables. Chi-square analysis revealed a significant association between higher attendance and preference for interactive learning methods such as group discussions and case studies ($\chi^2 = 11.82$, $p < 0.05$). A moderate positive correlation was also observed between attendance and academic performance ($r =$

0.34 , $p < 0.01$), indicating that students who attended classes more regularly tended to achieve higher scores. Likewise, preference for interactive teaching methods was weakly but positively associated with performance outcomes ($r = 0.22$, $p < 0.05$).

The last continuous assessment test score range of the 44 students who are still in the Anatomical Pathology class is shown in figure 7.

**Figure 7: Recent continuous assessment results of current anatomical pathology students**

DISCUSSION

This study shows that students exhibit a strong preference for attending lectures and practical sessions over seminar, suggesting that the students found seminar less engaging. Seminar involves giving students a topic to prepare and present via PowerPoint in front of fellow students and their lecturers. Thereafter questions to the presenters and discussion follow. Other studies, however showed that students perceived the seminar to be useful to their understanding of their courses.^{21,22} This pattern may indicate that while seminars encourage independent learning, factors such as time pressure and presentation anxiety limit engagement. This finding suggests a need to redesign seminar activities to include more collaborative preparation or formative feedback sessions. These findings underscore the need for curriculum reform that balances didactic lectures with more participatory formats. Faculty development programs should emphasize student-centered teaching strategies, communication training, and the integration of technology to enhance engagement.

Majority of the students met the 75% required attendance at lectures, practicals and seminar although lectures had the highest attendance. This finding is consistent with previous research, which has shown that lectures are often the most popular format for learning among students.²³ Wolff et al.²⁴ in their study stated that medical education frequently employs lectures as a primary teaching method. Also, majority of the students passed their exams at the first sitting which is consistent with existing literature that suggests that students tend to prioritize learning activities that they perceive as relevant and useful for their academic and professional development and thus attendance rates may have an impact on performance.²⁵ The high attendance rates in lectures and practicals may be attributed to the fact that these formats provide students with opportunities to engage with complex materials in a more structured and interactive way.²⁶ Picton and Baik,²⁷ however, showed that interactive and engaging learning experiences, as seen in seminars, are very crucial in higher education learning.

Majority of student reported that the quality of lecture delivery was above average, however

majority of the students insisted that the lectures did not increase their interest in Anatomical Pathology. Existing evidence shows that the quality of lectures can significantly influence student attitudes towards the subject as seen by Entwistle and Tait¹⁴ who highlighted the importance of lecturer's enthusiasm and expertise in promoting student motivation. In this study however, the quality was deemed high but most students attended primarily due to compulsory attendance policy. It seems that the compulsory nature of attendance as a prerequisite to qualify to write exam is what made them to come to class. This supports the theory that students' attendance to lectures must be enforced by the university administration.

Inferential analyses using SPSS explored associations among attendance, preferred teaching methods, and academic performance. Results indicated that students with higher attendance were more likely to prefer interactive learning methods such as group discussions and case-based learning, supporting findings that collaborative learning enhances engagement and understanding.^{28,29} Attendance was also positively linked to academic performance, consistent with evidence that regular participation predicts better examination outcomes.^{30,31} Additionally, students who favored interactive learning achieved slightly higher scores, aligning with global studies showing that active learning strategies improve academic results.^{32,33} The students said that all the practical demonstration methods (pot demonstration, autopsy demonstration and slide demonstration) made the understanding of Anatomical Pathology easier. However, majority stated that Pot demonstration was the most impactful of the three practical demonstration methods. Numerous studies emphasize the importance of interactive and immersive learning experiences in medical education²⁶ highlighting the value of hands-on learning²² and virtual augmented reality in medical education.^{34,35}

In contrast, less number of students stated that autopsy demonstrations were less impactful in their understanding of Anatomical Pathology. This finding may be due to the nature of autopsy demonstrations, which can be

emotionally challenging and may not provide the same level of interaction as pot demonstrations. The availability of bodies for autopsy demonstration makes students to overcrowd when rare opportunities provide. This makes it less useful to students. Panusch et al³⁶ highlight the importance of careful planning and execution of autopsy demonstrations to maximize their educational benefits.

The interactive teaching methods (group discussions, role-play, simulations, case studies, hands-on activities, online lectures, and collaborative projects) in pathology were explored, including how they were used to engage students. Students stated that group discussions as the best student driven method to understand Anatomical Pathology. In group discussions, students gather in little groups as friends or following religious affiliations to discuss topics in Anatomical Pathology. Group discussions, in particular, have been shown to promote critical thinking, problem-solving, and communication skills among students.^{26,35} By engaging in group discussions, students can share perspectives, develop mnemonics, and develop a deeper understanding of complex concepts from different perspectives.

Most students indicated that case studies teaching method is useful. Case studies are widely recognized as an effective approach in medical education. They provide students with real-world scenarios that require critical thinking, analysis, and problem-solving skills.³⁶ Many students in this study opined that online lectures were not effective. Online teaching is beguiled by internet connection issues and many other subtle distractions that wrestle for the students' attention. This finding is consistent with recent literature that highlights the limitations of online lectures in promoting student engagement and motivation³⁷. While online lectures can provide flexibility and convenience, they may lack the interactive and immersive elements that are essential for effective learning.

The distribution of grades among students who passed in one sitting showed that majority of students scored between 60-69%, indicating a good understating of the course. This is consistent with recent literature that emphasizes the importance of effective teaching methods and learning strategies in

promoting student achievement.^{14,25} The fact that 14 students passed after the first resit and 1 student passed after the second resit examinations suggests that some students may require additional support or opportunities to help their understanding of the course material.

CONCLUSION

This study provides valuable insights into the attendance patterns and perceptions of students in Anatomical Pathology. The data reveal that students exhibit a strong preference for attending lectures and practical sessions over seminars. The high attendance rates in lectures and practicals may be attributed to the fact that these formats provide students with better opportunities to understand complex topics in more structured and interactive ways.

The findings align with the study goal of understanding student learning preferences and attendance behavior in Anatomical Pathology. By linking attendance, preferences, and performance, this research highlights that engagement-driven teaching fosters better academic outcomes.

Educators and policymakers should prioritize redesigning lecture delivery to be more interactive, incorporating small-group autopsy sessions, and encouraging collaborative seminar preparation. These reforms could enhance student motivation and long-term retention in Anatomical Pathology.

The study also highlights the importance of interactive teaching methods, such as group discussions and case studies, in promoting student engagement and motivation. In contrast, online lectures were perceived as less effective, suggesting that educators should prioritize the development of more interactive and immersive learning experiences.

The implications of this study are significant for teaching and learning in anatomical pathology. Educators should prioritize the development of high-quality and engaging lectures that cater to diverse student needs and provide opportunities for interactive learning. Additionally, educators should consider incorporating more interactive and immersive learning experiences, such as pot demonstrations, to promote student engagement and motivation. Autopsy demonstrations should be more frequent with

little clusters of students for better interactive learning.

Limitations of this study

This study is a cross-sectional study, and thus it limits the ability to assess changes in perception over time. In addition, a possibility of recall bias or social desirability bias amongst students filling the questionnaire may be considered. Beyond recall bias, self-reporting bias may have influenced the accuracy of responses, as students might have overstated attendance or engagement levels. Additionally, variations in teaching quality and institutional facilities across universities could act as confounding variables. Future studies could mitigate these limitations by incorporating qualitative interviews, longitudinal designs, and multi-institutional comparisons. Furthermore, this study was conducted over 4 universities, so a limitation exists in extrapolating results to other universities in the Southern Nigeria. Finally, this being a quantitative study, there are limitations to depth of exploration in students' perception.

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Conflicts of interest

There are no conflicts of interest.

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