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Gender preference between traditional and PowerPoint methods of teaching gross anatomy

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Abstract:

INTRODUCTION: Teaching and learning process is increasingly metamorphosing from the traditional chalk and talk to the modern dynamism in the information and communication technology. Medical education is no exception to this dynamism more especially in the teaching of gross anatomy, which serves as one of the bases of understanding the human structure.

OBJECTIVE: This study was conducted to determine the gender preference of preclinical medical students on the use of traditional (chalk and talk) and PowerPoint presentation in the teaching of gross anatomy.

SUBJECTS AND METHODS: This was cross-sectional and prospective study, which was conducted among preclinical medical students in the University of Maiduguri, Nigeria. Using simple random techniques, a questionnaire was circulated among 280 medical students, where 247 students filled the questionnaire appropriately. The data obtained was analyzed using SPSS version 20 (IBM Corporation, Armonk, NY, USA) to find the method preferred by the students among other things.

RESULTS: Majority of the preclinical medical students in the University of Maiduguri preferred PowerPoint method in the teaching of gross anatomy over the conventional methods. The Cronbach alpha value of 0.76 was obtained which is an acceptable level of internal consistency. A statistically significant association was found between gender and preferred method of lecture delivery on the clarity of lecture content where females prefer the conventional method of lecture delivery whereas males prefer the PowerPoint method. On the reproducibility of text and diagram, females prefer PowerPoint method of teaching gross anatomy while males prefer the conventional method of teaching gross anatomy.

CONCLUSION: There are gender preferences with regard to clarity of lecture contents and reproducibility of text and diagram. It was also revealed from this study that majority of the preclinical medical students in the University of Maiduguri prefer PowerPoint presentation over the traditional chalk and talk method in most of the questions ask.

Keywords:

Gender preference, gross anatomy, traditional method of teaching, PowerPoint methods of teaching

Introduction

Anatomy has been considered to be the basic backbone of medical education for hundreds of years. Good knowledge of anatomy plays a vital role in the proper understanding of any other branch of

Medicine.^[1] Teaching and learning are active processes occurring simultaneously on a continuous basis.^[2] Teaching is a means of facilitating and supporting learning and involves contingent functions.^[3] However, learning is the cognitive processes whereby an individual acquires the professional and ethical values, the biomedical, behavioral, and clinical knowledge, reasoning,

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and psychomotor skills necessary for professional competence.^[4]

The conventional blackboard teaching method provides strong student-teacher interaction, but its effectiveness declines as the number of students in the class increases; hence, it is more preferential method during small group teaching.^[5]

A chalk and talk (traditional method of teaching) is a uniquely effective medium of classroom instruction and has been used commonly in lectures. It is inexpensive, easy to clean and reuse; allow students to keep pace with the teacher; and is not dependent on electricity. However, it is time-consuming; one cannot go back to what has been erased and is not so effective for a large number of students.^[6]

PowerPoint presentation, accompanied with multimedia projectors, have remarkably revolutionized teaching.^[7] They provide a visual stimulation that is particularly handy in sustaining interest and understanding complex medical concepts.^[8] PowerPoint presentation has the advantage of using colors, fonts, diagrams, and animation.^[9] Powerpoint presentation has the disadvantage of difficulty in note taking; has the tendency to overload information; and needs electricity and students seemed to become passive observers, rather than active participants.^[10] PowerPoint presentation-based lectures are increasingly being delivered in medical colleges as in other colleges and universities.^[11] However, educationists are divided on the superiority of PowerPoint presentation with respect to the traditional chalk and talk method.^[12]

Various studies^[1,5,9] have been conducted to assess the effectiveness of lectures using PowerPoint presentation or other such media in comparison to lectures using chalk and talks. However, there is a mixture of views based on previous studies conducted^[1,5,9] and it is not clear whether a particular lecture delivery method is superior to others. Moreover, most of these studies have not really been explored in the developing countries where power outage is an important factor of consideration. Therefore, this study was aimed at finding the influence

of gender on the preferred teaching method, between traditional chalk and talk and PowerPoint presentation in the teaching of gross anatomy.

Subjects and Methods

This was cross-sectional and prospective questionnaire-based study, which was conducted in the College of Medical Sciences, University of Maiduguri, Nigeria. The University was established in 1975 by inheriting the facilities of the North-East College of Arts and Sciences. The College of Medical Sciences was later established in 1977, to train Physicians and other Professionals in support of national policy objectives in the health and related sectors.

The questionnaire-based comparative study was conducted from December 2015 to April 2016 in the College of Medical Sciences, University of Maiduguri, Nigeria. Using simple random methods techniques, two batches of medical students ($n = 247$), one from 2nd year ($n = 135$ with 96 males and 39 females), and another from 3rd year ($n = 112$, 80 males and 32 females) were recruited. All the 1st year medical students and nonmedical students were excluded since they do not offer anatomy as a course. The questionnaire which comprises of two sections, demographic data and structured closed questionnaire was provided. The demographic data consists of three^[3] items: age, gender, and possession of laptop or tablet computer. The structured questionnaire consists of eight questions on the perception of students on chalk and talk versus PowerPoint presentation as a teaching technique for teaching gross anatomy. The study questionnaire was designed carefully after a thorough literature review, and some of the questions were adapted from other similar previous studies.^[1,13]

The study methods involve briefing the target participants in the class about the study and the informed consent was obtained from students, then the questionnaire was circulated to all the students of that particular batch. For each of these methods, the students were asked to tick for each question [Table 1] against their preferred methods of teaching gross anatomy.

Table 1: Questions on chalk and talk and PowerPoint presentation

| Questions number | Items | C and T | PPT |
|------------------|--|---------|-----|
| Q1 | Which method is clearer regarding the lecture contents? | | |
| Q2 | Clarity of diagram is better with which method? | | |
| Q3 | In which method you are able to take down notes more easily? | | |
| Q4 | Which method has more reproducibility of text and diagram? | | |
| Q5 | Which method is more interest stimulating? | | |
| Q6 | Which method had better continuity of lecture? | | |
| Q7 | With which method is lectures more organized and structured? | | |
| Q8 | Overall satisfaction and effectiveness of the lecture is better with which method? | | |

C and T=Chalk and talk, PPT=Power point presentation

The data were expressed as frequency and percentage. Chi-square was used to test for association between gender and preferred method of lecture delivery. Pearson's and intra-class correlations were employed to test the validity and reliability of the items of the questionnaire. An item with a Cronbach's alpha of ≥ 0.70 was considered to be strongly reliable. Furthermore, items with person's correlation > 0.138 (Pearson's central distribution at $df = 200, P < 0.05$) was considered to be valid. SPSS version 20 (IBM Corporation, Armonk, NY, USA) was used for statistical analyses. $P < 0.05$ was set as the level of significance.

Results

The response of the preclinical medical students was sought. The Cronbach alpha value of 0.76 was obtained which indicate acceptable level of internal consistency. Table 2 shows the test of reliability and validity of the items of the questionnaires. All the items of the questionnaire were found to be reliable and valid.

With respect to clarity of diagrams, there was statistically significant differences in gender preference with respect to two methods of teaching, 65 (63.1%) males as compared to 38 (36.9) females consider chalk and talk to be better, whereas 111 (77.1%) males preferred PowerPoint presentation 33 (22.9%). On the other hand, 36 (73.5%) male students as compared to 13 (26.5%) female students are of the view that lecture content is clearer with chalk and talk, whereas, 139 (70.9%) male students and 57 (29.1%) female students consider lecture content to be clearer with PowerPoint method of lecture delivery as shown in Table 3.

Table 2: Test of reliability and validity of the items of the questionnaires

| Items | Cronbach's alpha | Pearson's correlation* |
|-------|------------------|------------------------|
| Q1 | 0.722 | 0.64 |
| Q2 | 0.744 | 0.43 |
| Q3 | 0.741 | 0.47 |
| Q4 | 0.739 | 0.48 |
| Q5 | 0.713 | 0.71 |
| Q6 | 0.716 | 0.70 |
| Q7 | 0.718 | 0.65 |
| Q8 | 0.707 | 0.76 |

*The Pearson's central distribution $r=0.138, df=200, P<0.05$

Table 3: Chi-square test for association between gender and preference of two methods on clarity of diagram and lecture content in teaching gross anatomy

| Questions | Preference | Male (%) | Female (%) | χ^2 | P |
|-----------|------------|------------|------------|----------|-------|
| Q1 | C and T | 65 (63.1) | 38 (36.9) | 5.73 | 0.017 |
| | PPT | 111 (77.1) | 33 (22.9) | | |
| Q2 | C and T | 36 (73.5) | 13 (26.5) | 0.13 | 0.72 |
| | PPT | 139 (70.9) | 57 (29.1) | | |

C and T=Chalk and talk, PPT=Power point presentation

Out of the 166 students who preferred chalk and talk in "note taking," 68.7% were male while 31.3% were female. Eighty (80) students preferred PowerPoint presentation out of which 76.2% were males and 23.8% were females. There was no any statistically significant difference between genders in the preferred method for taking down note [Table 4]. In the case of reproducibility of text and diagrams, most of students preferred PowerPoint presentation (67.4% of males and 32.6% of females) instead of chalk and talk (80.6% of males and 19.4% of females) with a statistically significant difference between the genders [Table 4].

Interest is highly stimulated, based on the response of the students, through PowerPoint presentation (57.2% students) as compared to chalk and talk (42.7% students); however, the difference is not statistically significant differences between genders. Same applies in the case of "lecture continuity." Most of the students preferred PowerPoint as compared to chalk and talk with no statistically significant difference [Table 5].

With respect to lecture organization, statistically significant difference exists in the preference of the male and female students. From the participants, 145 have preference for PowerPoint presentation where 71.7% were males and 28.3% were females. When it comes to overall satisfaction and effectiveness of lecture (49.2% of students preferred chalk and talk and 50.8% students preferred PowerPoint presentation method) no statistically significant difference was found among the male and female participants [Table 6].

Discussion

Lectures have been the most common form of teaching and learning since ancient times.^[14] The present

Table 4: Chi-square test for association between gender and preference of two methods on note taking and reproducibility of text and diagram

| Questions | Preference | Male (%) | Female (%) | χ^2 | P |
|-----------|------------|------------|------------|----------|-------|
| Q3 | C and T | 114 (68.7) | 52 (31.3) | 1.51 | 0.22 |
| | PPT | 61 (76.2) | 19 (23.8) | | |
| Q4 | C and T | 54 (80.6) | 13 (19.4) | 4.11 | 0.043 |
| | PPT | 120 (67.4) | 58 (32.6) | | |

C and T=Chalk and talk, PPT=Power point presentation

Table 5: Chi-square test for association between gender and preference of two methods on interest stimulating and better continuity

| Questions | Preference | Male (%) | Female (%) | χ^2 | P |
|-----------|------------|------------|------------|----------|------|
| Q5 | C and T | 75 (71.4) | 30 (28.6) | 0.008 | 0.93 |
| | PPT | 100 (70.9) | 42 (29.1) | | |
| Q6 | C and T | 75 (69.4) | 33 (30.6) | 0.42 | 0.52 |
| | PPT | 101 (73.2) | 37 (26.8) | | |

C and T=Chalk and talk, PPT=Power point presentation

Table 6: Chi-square test for association between gender and preference of two methods on lecture organization and overall satisfaction and effectiveness of lecture

| Questions | Preference | Male (%) | Female (%) | χ^2 | P |
|-----------|------------|------------|------------|----------|------|
| Q7 | C and T | 72 (70.6) | 30 (29.4) | 0.04 | 0.85 |
| | PPT | 104 (71.7) | 41 (28.3) | | |
| Q8 | C and T | 82 (68.3) | 38 (31.7) | 1.02 | 0.31 |
| | PPT | 92 (74.2) | 32 (25.8) | | |

C and T=Chalk and talk, PPT=Power point presentation

study was conducted to find the gender preference of preclinical medical students with respect to the use of either chalk and talk or PowerPoint presentation as a teaching technique in the teaching of gross anatomy.

In this study, PowerPoint presentation has been observed to favor clarity of text and diagrams as well as the ability to reproduce text and diagram. Similarly, Seth *et al.*^[15] reported that majority of medical students preferred PPT because of better quality of texts and diagrams, graphs, animations, and videos. It was considered ideal for fast revision and quick overview of the subject. Similarly, Lalvarmawi^[7] reported that PowerPoint-based teaching method provides a better quality of text and diagrams as well as the ability to integrate text, pictures and images. The study also reveals that majority of the students consider lectures through PowerPoint presentation to be more organized and well structured. This is in consonance with a study conducted on 100 medical students to find out which of the different teaching methods used in physiology lectures was best preferred by students. It was observed that students prefer PowerPoint presentation more than overhead projector and the traditional chalk and board method.^[16]

On the other hand, this study reveals that students prefer chalk and talk in taking down notes. This is similar to what was reported by Jabeen and Ghani,^[1] that chalk and talk encourages the ability to take down notes more easily in their study conducted among medical students of government medical college in Jammu, India, in which 80% of the students prefer chalk and talk to be better in taking down notes. However, this finding is in contrast to what was reported in other previous studies where majority of students found comfortable to take down important points with PPT and serve as a good means of learning in the form of notes which saves time and enables quick revision.^[5,17] These differences in preference may be as a result of other factors such as possession of electronic devices and availability of electricity among other things.

Overall satisfaction and effectiveness of lectures was found to be better with PowerPoint presentation in this study as it was observed by Savoy *et al.*^[18] Same result was

obtained during a cross-sectional study involving 400 undergraduate medical students conducted in a private medical college in Lucknow region, Uttar Pradesh, India, where the study reported that students preferred PPT teaching over the other teaching techniques.^[17] It was also suggested that PPT utilization can assist teachers in helping their students in the teaching and learning process.^[19] Whereas, according to another study, students from biomedicine and medicine favor classes conducted using blackboard presentation compared to PPT.^[20]

Based on the result of the current finding, it can be suggested that integration of the use of PowerPoint presentation and chalk and talk method in the teaching of gross anatomy will overwhelmingly improve students' understanding and overall performance in gross anatomy. The findings of the present study can assist in the structuring and organization of lecture classes and to make the students more active and participate in the teaching and learning process. This kind of research should be conducted periodically and in other subfields of anatomy to assess the students' perception and preference as well across institutions for betterment of the system of medical education in Nigeria.

Conclusion

There are gender preferences with regard to clarity of lecture contents and reproducibility of text and diagram. It was also revealed from this study that majority of the preclinical medical students in the University of Maiduguri prefer PowerPoint presentation over the traditional chalk and talk method in most of the questions asked across gender. However, a reasonable number of students have also indicated their preference to the conventional method in certain aspects of the teaching and learning process irrespective of gender. Therefore, integration of the use of PowerPoint presentation and traditional method in the teaching of gross anatomy will overwhelmingly improve students' understanding and overall performance in gross anatomy.

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Conflicts of interest

There are no conflicts of interest.

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