ORIGINAL ARTICLE

EFFECTIVENESS OF ANATOMICAL DISSECTION TABLE VERSUS TRADITIONAL ANATOMICAL MODELS IN STUDENTS OF GOMAL MEDICAL COLLEGE, DI KHAN

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Background: Very few studies have been conducted comparing the effectiveness of students for anatomical dissection table learning and traditional model based learning. In this study a direct comparison of anatomical dissection table learning and traditional models-based learning has been made which provides valuable insights into their strengths and weaknesses. **Methods:** This randomized parallel group experimental study was conducted on 1st year MBBS students in Department of Anatomy, Gomal Medical College, DI Khan from March to May 2025. Students included were randomly assigned into two different groups. Group A (n=58) were taught using virtual anatomical dissection table, and Group B (n=58) were taught using traditional models. Both groups had no prior experience with anatomical dissection table and anatomical models. At the end of the study the post evaluation test based on MCQs was conducted. **Results:** The analysis demonstrated a statistically significant difference in the mean post-test scores between the two groups. Students taught using the virtual anatomical dissection table (Group A) achieved significantly higher scores compared to those taught using traditional anatomical models (Group B), ($p<0.001$), indicating highly significant differences. **Conclusion:** The teaching methodology utilizing the Anatomage Table is significantly more effective than the traditional methods.

Keywords: Anatomic models, Anatomical dissection table, Gross anatomy, Teaching methodology

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INTRODUCTION

Anatomy is one of the subjects taught when a student first enters a medical school. It opens windows to the intricate study of organs, tissues and cells from the macroscopic details to the microscopic ones.[1] Having a strong grip on the anatomical organisation of the human body lays the foundation to excel in various fields of medical science like radiology, surgery, medicine, etc.[2] Being the cornerstone of medical science, it demands to bring innovative teaching methods to the forefront of medical sciences.[3]

During the earlier days teaching and learning human anatomy was more or less limited to cadaveric dissections.[4] Even today, in the era of scientific and technological advancement many anatomists still advocate for the inclusion of cadaveric dissections as part of learning human anatomy.[5] However, as the demand for doctors and thus the establishment of new medical colleges grew, it eventually led to the shortage of cadavers for dissections.[6] Moreover, the use of human bodies for dissection and learning raised various ethical concerns.[7] As science advanced, the use of plastic models for demonstrating the basic structures and their relations increasingly came into practice.[8] Today, in the era of artificial intelligence and technological advancement, we see the use of virtual anatomical dissection table becoming popular as it not only allows the students to understand the structures and the relations of various organs but also allows to visualise minute details easily.[9]

There had been many researches which prove that the use of virtual anatomical dissection table is indeed beneficial for the learning and the knowledge retention of the students.[10] Some of the researchers compared the use of virtual anatomical dissection table with the traditional cadaveric dissections and found that students find the virtual anatomical dissection table easy to operate and understand.[11] However there has been limited research for evaluating the learning of human anatomy through the use of plastic models as compared to learning with the virtual anatomical dissection table.

This study aims to evaluate and compare the effectiveness of teaching with virtual anatomical dissection table in comparison to the traditional method of teaching with anatomical models. It aims to determine the most efficient method for learning human anatomy whether it is in the form of anatomical models, virtual anatomical dissection table or perhaps a combination of both.

MATERIAL AND METHODS

The study was conducted in Department of Anatomy, Gomal Medical College, Dera Ismail Khan, Pakistan after getting ethical approval from Ethical Review Committee, Gomal Medical College, DI Khan, Pakistan vide No. 253/GJMS/JC.

This study used a randomized parallel group experimental census-based study to evaluate the effectiveness of virtual anatomical dissection table versus traditional anatomical models. The participants were all 1st Year MBBS students. The inclusion criteria were students enrolled in the anatomy course, with informed consent, and no prior experience with Anatomage Table. The excluded students were those with visual or cognitive impairments, those that previously failed the anatomy course and those having low attendance during the study. The 116 eligible students were randomly divided into two groups; Group A and Group B of 58 students each by simple random sampling technique.

Group A was taught using the virtual methods by the visualisation of structures on Anatomage Table. Group B was taught using the traditional methods of teaching with the anatomical models. Both the groups were exposed to pre-decided topics of curriculum including gross anatomy of upper limb for a duration of two and half months from 1 March 2025 to 15 May 2025. To reduce the bias the same one instructor taught both the groups.

After completion of study duration, a post evaluation test was conducted based on MCQs related to the discussed topics. A total of 58 students from group A and 58 students from Group B appeared for the test. The final results were analysed using IBM SPSS-23. The descriptive variables are presented as Mean±SD. Estimation of parameters for population is presented as confidence interval at 95% confidence level for mean.

RESULTS

Each group consisted of 58 students. An independent samples *t*-test was conducted to compare the post-test scores of students taught using the Anatomage Table (Group A) and those taught using the traditional method (Group B). The analysis demonstrated a statistically significant difference in mean scores between the two groups (p<0.001). The standard deviation of post-test scores was 17.56 in Group A and 38.72 in Group B (Table-1). This result indicates that students taught using the Anatomage Table performed significantly better on the post-test than those taught using traditional methods.

Table-1: Post-test scores of students in Group A and Group B

Teaching method	N	Mean	SD	SEM	*p*
Anatomage table	58	50.2374	17.55821	2.30551	<0.001
Traditional method	58	38.7166	19.06473	2.50332	<0.001

There was a significant effect of teaching methodology on student performance. The mean score in Group A was significantly higher than that of Group B suggesting the Anatomage Table was more effective for learning anatomy.

DISCUSSION

This study aimed to compare the effectiveness of the Anatomage Table versus traditional anatomical models among the students at Gomal Medical College, Dera Ismail Khan, Pakistan. The findings indicate that students exposed to Anatomage Table demonstrated a significantly stronger understanding of the anatomical structures compared to those who used traditional models, as evidenced from the post-evaluation test scores.

The better learning of students by using Anatomage Table is because of its 3D visualization features, which allow interactive study of the human body. These features provide a more active and immersive learning experience potentially improving retention and comprehension, especially of complex anatomical relations. These findings are in accordance with the results of previous studies[4,10,13–15] which have also concluded that digital anatomy learning can enhance students learning.

Some other cross-sectional studies[12,16] reported no statistically significant differences between the two groups. Yet another study by Totlis T *et al* conducted on students' perception of teaching by traditional methods compared to online learning and modern techniques revealed that traditional methods were more effective.[17]

This study has certain limitations that should be considered when interpreting the results. It was conducted at a single institution, limiting the generalizability of results to other medical colleges. The sample size used for the study is relatively small as the sanctioned total number of students in a class for our institution is 120. Future studies should consider multicentre trials with larger cohort. Finally, no qualitative data was collected regarding students' perceptions, preferences or satisfaction with the learning modalities.

This study opens doors for future researches to find better ways of teaching human anatomy to undergraduate students at medical schools. This study paves the way for highly advanced researches like the use of hologram technology in this field.

Considering the findings reviewed, the Anatomage Table offers a great benefit compared to traditional anatomy learning methods using anatomical models. The current study shows that the Anatomage Table can improve spatial awareness, retention of anatomical learnings, and it reduces ethical issues associated with cadavers.

CONCLUSION

The teaching methodology utilizing Anatomage Table was superior to traditional methods in improving students' academic performance.

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HZ: Results tabulation
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