



## Original Research Article

## Model preparation: A novel implement for teaching & learning anatomy and its perception on undergraduate medical students at AIIMS Raipur

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## ARTICLE INFO

## Article history:

Received 15-11-2019

Accepted 12-12-2019

Available online 31-12-2019

## Keywords:

Model preparation

Medical education

## ABSTRACT

**Introduction:** Anatomy is the subject where teaching and learning is not possible by studying books alone, it needs to be explained by dissection and other methods also. Model preparation is the recent scientific findings, which gives the three-dimensional orientation of the students concerned. Therefore research question of the present article, Is this technological innovation useful for medical students to learn and understand the three-dimensional view of embryology?

**Aim:** To Increase the interest of students in learning of anatomy, to generate understanding of three-dimensional view in anatomy and to get feedback of students towards model preparation.

**Materials and Methods:** The study was conducted for first year MBBS students, they were divided into groups of 10 students during practical classes. Total of 10 groups formed, and each group contained ten students. Each group was given seven days' time to prepare their anatomy model using materials. Each model was evaluated, and feedback was taken in a structured questionnaire form.

**Result:** 78% of the student's felts model preparation fruitfulness in the favour of 3-dimensional orientation as well as they enjoyed a lot to prepare. 29% of students reported the model preparation disturb their routine activity. 77% of students accepted to prepare this type model in the future.

**Conclusion:** Overall perception of students based on feedback, towards model making, reflected the improvement in quality of teaching and learning activities in anatomy subject.

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### 1. Introduction

Recently, health sciences are exploring the field for researchers to improve the knowledge and correlate advanced technologies in the health field.<sup>1,2</sup> Basic medical sciences should adopt their curriculum and methodology according to need. Pre-clinical subjects are a pillar of medical sciences. Among them, anatomy is considered for morphological sciences and divided into macro anatomy, microanatomy, and developmental anatomy.

In 1980s', the duration for basic sciences of 1st-year medical students was enough i.e., one and a half years. After that curriculum time reduced to one year, these days, medical universities again diminished teaching

hours for basic sciences as well as anatomy. In some Institutes, cadaveric based anatomy and dissection are no longer taught, and they are replaced by software-based imagine anatomy like- Anatomage.<sup>3</sup> Many anatomists believed these types of changes deteriorate the efficiency of learning and teaching in medical education.<sup>4,5</sup> However, embryology deals with microscopic structures based on indirect observation. In human embryology classes, usually artificial models are used to explain different phases of growth and development of the embryo. They help to understand the 3D structure of embryo. These commercialized models are highly expensive. Therefore some anatomists suggested to replace it by handmade models constructed by first year students during their classes.<sup>6,7</sup>

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Medical Universities are peculiar for the number of teaching hours, but they do not specify about quality and distribution of divisions. Earlier, lectures were a primary mode of teaching. However, nowadays, the role of problem-based learning that correlates clinical cases with basic sciences are in focus. Dissection based cadaveric studies and microscopic studies are well enough to understand gross anatomy and microanatomy, respectively. After seeing all perspectives, we decided to conduct an embryology based model making competition among 1st-year medical students. The goal of the competition was to motivate the students for better cognition and apprehension.

## 2. Materials and Methods

The present study was performed in the Department of Anatomy, All India Institute of Medical science, Raipur (C.G). This study consists of first year MBBS Students who completed their 80% anatomy syllabus. They were divided into groups of 10 students during practical classes. Total of 10 groups formed, and each group contained ten students. Each group had a mentor to guide them. They were advised to use textbooks, the internet, and already prepared models. The materials used to make models were papers, cardboard, plaster of Paris, sand, clay, sawdust, thermocol, waste cloths, etc. Each group instructed to make two models that completed in one-week duration under skilled supervision. After one week, 20 prepared models displayed for competition. Three medical professors of other Department judged the event. The judgment based on knowledge of students related to developmental anatomy as well as clarity of models.

After completing the embryology model preparation competition, we did a questionnaire based feedback from students without mentioning their identity. The aim was to analyse the impact of model-based competition on students.

## 3. Results

The analysis indicated that most of the students responded the same for maximum questions except question no 1, 5, and 7 [Figure 1] The questionnaire analysis indicated various materials used to make models apart from given options. Maximum students (78%) felt its fruitfulness in favour of 3-dimensional orientation as well as they enjoyed a lot to prepare these models. Time allotted (7 days) was enough for it; at the same time, 29% of students reported the disturbance of their routine activity [Figure 2].

These days everyone is familiar with the use of social websites, and 60% of students uploaded their pictures of prepared models in it. The purpose was to share the knowledge with their friends of different medical institutes as well 25% agreed that it was for fun and publicity only [Figure 3]. 77% of students accepted to prepare this type of models in the future if time allowed [Figure 2]. During

model preparation, students committed that they thoroughly studied textbooks for the betterment of proper preparation.

## 4. Discussion

Earlier students were totally rely on knowledge of teachers and lectures were major mode of learning, while practical knowledge also given by teachers only. So, teachers were assumed as "Absolute Lord of Knowledge" who was the only source of knowledge.<sup>8</sup> Recent scientific findings and technological innovations explore a new novelty in the health science field, such as videos, Wikipedia, animated descriptions and other online modalities.<sup>9</sup> Presently, self-knowledge and self-reflection helps the learning.<sup>10</sup> On that behalf, today teachers also need to access the understanding of students for subjects. For that purpose, aim of this study was to construct models of embryology by the students to facilitate the lacuna of practical part of embryology. After compiling of results of presented study, majority of students admitted the fruitfulness of model making competition. In addition, students worked excellent in group as a team work. Previous studies said that "group learning facilitates not only the acquisition of knowledge but also several other desirable attributes, such as communication, team work, problem solving and information sharing skills, as well as respect for others opinions."<sup>11</sup>

Approximately 4-5% students have given negative response. Now question arises, what was the reason of it? Being a teacher we have responsibility to search out the problem of these 5% students and to resolve it though number is less. Embryology have its own pros and cons, it deals with microscopic structures that have dynamic changes during development of an embryo.<sup>8</sup> In this context, demonstrators have used alternative methodologies.<sup>12</sup> 30-40% students have different thought regarding question no. 5&7, they agreed to disturb their daily activity and uploaded models in social media to get publicity only. On that behalf, we analysed the need of some settings of time management for the students during their fundamental classes. Miranda & Barroso, 2004 stated this type of study fill the purpose of supportive education with articulation of knowledge in the community, school and environment.

Present study reflects the need of this type of periodic activity. It helps to maintain two way relations between students and teachers.

## 5. Conclusion

The reason of this study is to motivate the students for fundamental knowledge. The role of teachers is to give proper guide the students. It improves long term memory of basic sciences and act as a pillar to develop skill of clinical.

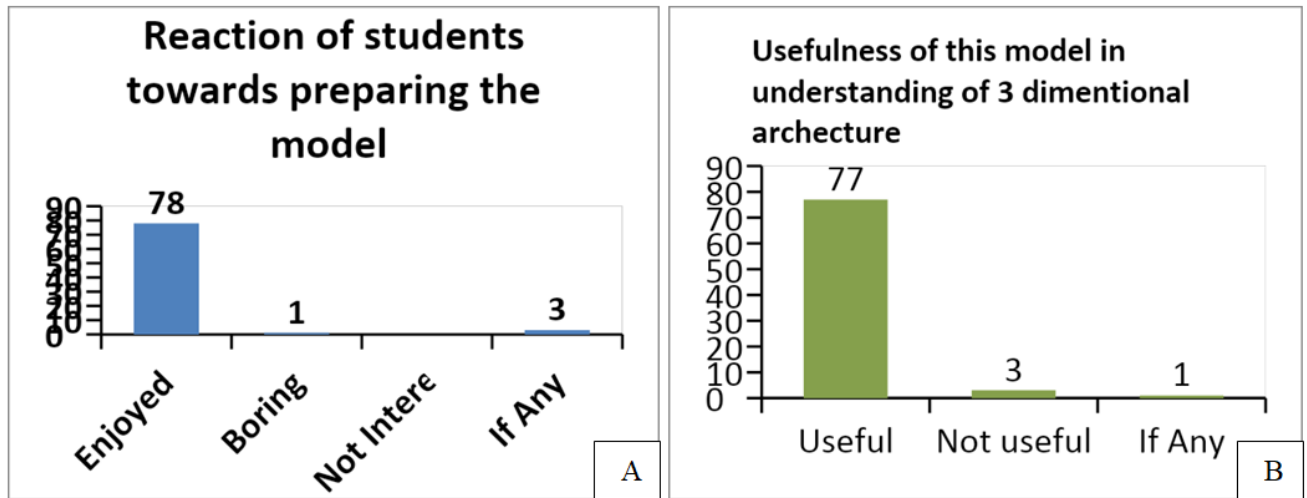


Fig. 1:

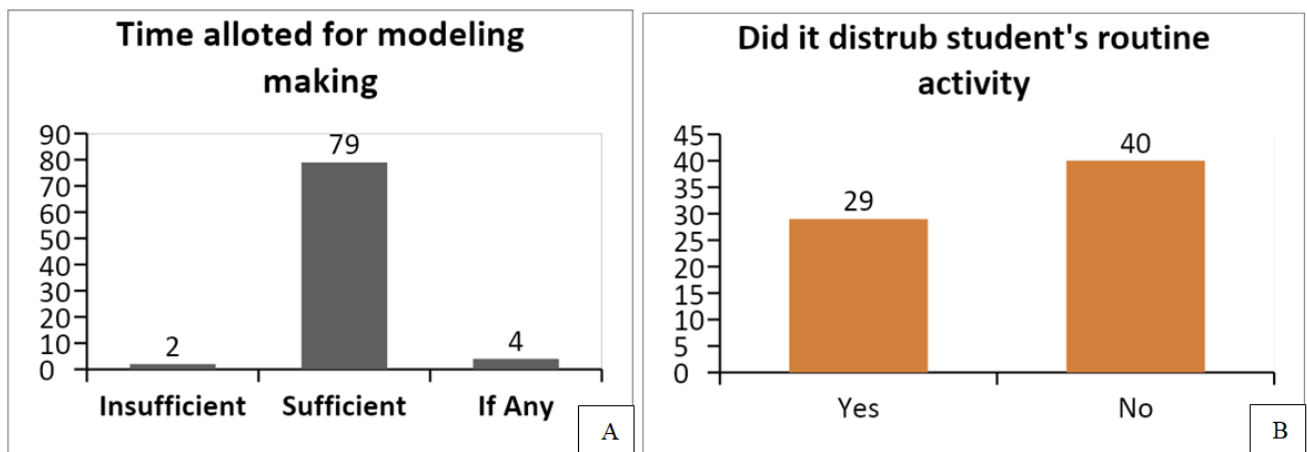


Fig. 2:

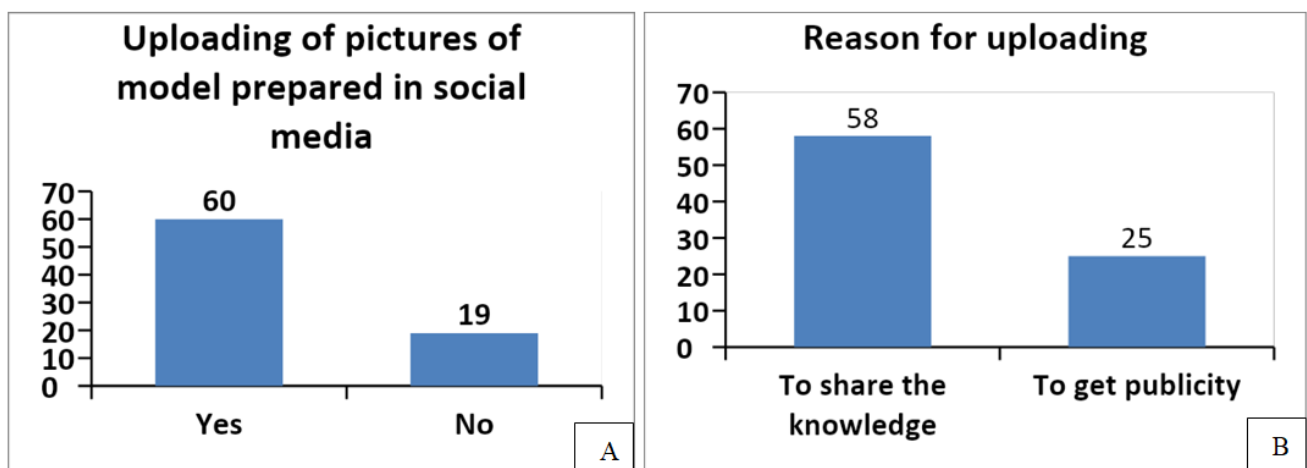


Fig. 3:

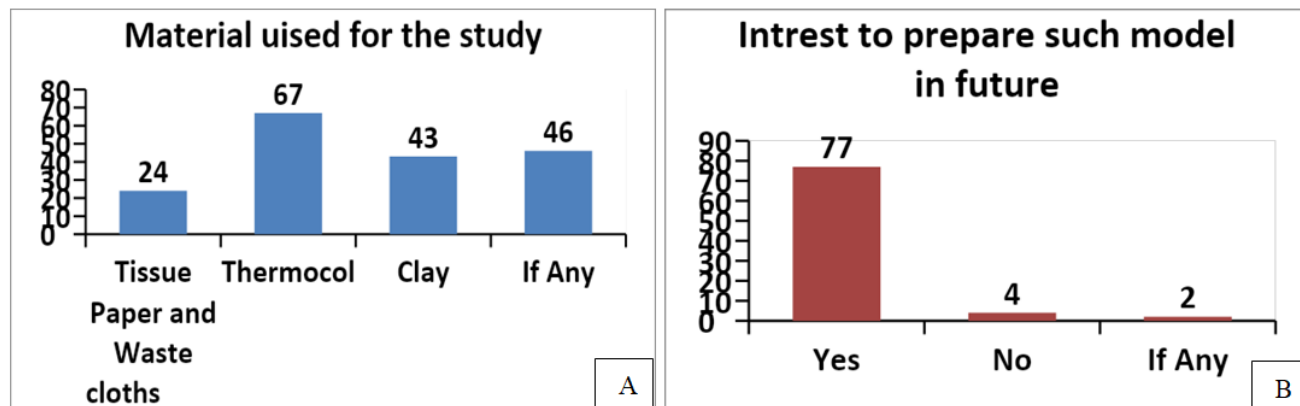


Fig. 4:



Fig. 5:

## 6. Source of funding

None.

## 7. Conflict of interest

None.

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**Cite this article:** Singh P, Rathore M, Trivedi S, Sharma DK, Pandey S. Model preparation: A novel implement for teaching & learning anatomy and its perception on undergraduate medical students at AIIMS Raipur. *Indian J Clin Anat Physiol* 2019;6(4):457-461.