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MULTIPLE APPROACHES IN ONLINE TEACHING OF ANATOMY - A STUDENT PERSPECTIVE SURVEY

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ABSTRACT

Anatomy is one of the vast subjects in medicine that require an extensive, good understanding of the concepts and a powerful memory to remember the facts and recall them instantly. This requires constant and regular revision. Teaching anatomy, even through online sources, during holidays and in other times of disinfection is crucial to enquire and store knowledge efficiently.

A self questionnaire was prepared, comprising 10 questions and administered to 100 students from medical colleges belonging to the age of 18-25. The participants were sent the questionnaire through an online google sheets link. The questions were studied carefully and corresponding answers were marked by the participants. The data were collected and statistically analyzed.The overall result was positive and students were open to new creative

ways of online classes and activities. Among the participants, 90% think that teaching anatomy online is difficult but with suitable aids it will be helpful and can yield better results and be deemed to be effective.. Anatomy is quite a challenging subject to teach online, but with proper student co-operation and enthusiasm towards knowledge of the subject, it is not impossible.

INTRODUCTION

There are various types of online teaching methods like using live video classrooms and there are even websites that conduct or let you host online quizzing on the topic that you are interested in. (Pratha and Thenmozhi, 2016)There are different sources to share PowerPoint presentations to many people in a group, at the same time.(Sriram, Thenmozhi and Yuvaraj, 2015)(Johnson *et al.*, 2020)Some fun games like KAHOOT and other faster fingers to win games promote learning in a fun online way.(Keerthana and Thenmozhi, 2016; Menon and Thenmozhi, 2016) There are also other things like online crossword puzzles, matching the facts, jumbled words, rearrange the order of the pathway correctly, creating mnemonics and labeling pictures and identifying them properly. (Sekar*et al.*, 2019; Johnson *et al.*, 2020)(Keerthana and Thenmozhi, 2016)

There are a lot of facts and names to remember in the anatomy subject, revision and constant repetition of whatever was taught were necessary to reproduce the answer at the time during an examination.(Seppan*et al.*, 2018) Anatomy is a subject that a student always has to be in touch with to remember everything and recollect information easily as it is a very vast subject.(Sriram, Thenmozhi and Yuvaraj, 2015; Thejeswar and Thenmozhi, 2015; Nandhini,Babu and Mohanraj, 2018)

Anatomy can be taught easily with the help of digital aids and most concepts in the subject are taught to understand all aspects of a topic one should be able to visualise what they are studying. they can be supplied to every student through pictography.(Thejeswar and Thenmozhi, 2015; Nandhini, Babu and Mohanraj, 2018) Extensive picturization can help the student obtain a clear idea of the topic. (Krishna and Babu, 2016; Seppan*et al.*, 2018)(Nandhini, Babu and Mohanraj, 2018).Anatomy is taught using various teaching modalities like watching videos, making mind maps on the given topic, online quizzes, labeling diagrams, using visual aids and so on. (Choudhari and Thenmozhi, 2016)

MATERIALS AND METHODS

The study setting is an online setting which is a student perspective study.The pros of such a study are minimised error, cost-free process of circulating the survey and obtaining results, it also is possible to collect large data. Its cons are that the irrelevant options could be provided by the survey and the respondent or participant may skip some questions. Non-probability convenient sampling was used. The measures taken to minimise the sampling bias were done to check external and internal validity.The data collection or tabulation of the survey for questionnaire comprises a self-constructed questionnaire having 10 questions.

The questionnaire validity checking was done. The internal validity was checked by giving the questionnaire to 3 staff from college and the validity was checked. The external validity was done by giving the questionnaire to 3 random people and the validity was checked.

The data collecting software used was the Google forms and for descriptive statistics SPSS version 20 was used. The list of output valuable to be assured was the difficulty of the subject, need of teaching and the challenges of the teaching online. The method of representation of each output variable was through a pie chart or bar chart. The statistical test used was the point prevalence and the chi square test.

RESULTS & DISCUSSION

From figure 1, 92% of the participants found anatomy to be a hard subject. 8% of the participants did not find it hard. From figure 2, 97% of the participants thought anatomy had a lot of facts to remember and 23% of the participants did not think anatomy had a lot of facts to remember. From figure 3, 89% of the participants thought reading visually would help understand the topic clearly. 11% of the participants did not think visual aid would help . From figure 4, 86% of the respondents thought it is possible to learn anatomy without the help of a cadaver. 14% of the respondents thought it is not possible to learn anatomy without the help of a cadaver. From figure 5, 85% of the respondents thought pictographs make learning anatomy easier .15% of the respondents don't think pictographs make anatomy easier. From figure 6, 92% said anatomy calls for regular revision, and 8% said they don't think regular revision is needed. From figure 7, 89% of the students think mind mapping helps to assemble the facts together easily and 11% of the students think mind mapping does not help assemble the facts easily. From figure 8, 84% of the participants think online activities are effective and 16% don’t think online activities are effective. From figure 9, 92% of the participants believe problem-based learning is efficient. 8% of the participants don't believe problem-based learning is not required. From Figure 10, 56% of the participants thought it was a challenging task and 44% of the participants thought it was not challenging.

From figure 1, when asked if the student found anatomy as a difficult subject, 92% of the total students found it hard and 8% found it not so hard.(Subashri and Thenmozhi, 2016) Another study compares teaching anatomy in labs to teaching anatomy online.(Samuel and Thenmozhi, 2015) From figure no.2,when asked do you think anatomy had a lot of facts to remembe 97% of the participants thought and 23% of the participants did not think so.(Hafeez and Thenmozhi, 2016) From figure no.3,when asked do you think there is need for digital aid to help visualise topics , 89% of the participants thought it would help.(Kannan and Thenmozhi, 2016) 11% of the participants did not think it would help.(Biggs and Tang, 2015; McBride and Drake, 2015) From figure no.4, when asked do you think you can learn anatomy online without the help of a cadaver, 86% responded positively and said it is possible.(Evans, 2015)14% of the respondents thought it is not possible.(Pather, 2015)

From figure no.5, when asked do you think pictographs make learning anatomy easier 85% of the respondents agreed to it while 15% did not think that way.(Bergman, 2015) From figure no.6,when asked do you think anatomy as a subject calls for regular revision in order to remember all the topics.(Dutton and Ryznar, no date; Rubin, 2013; Taylor, 2014; Kannan and Thenmozhi, 2016; Peterson, 2016; Aktor, 2018; Darby and Lang, 2019) About 92% said yes and agreed 8% said no.(Thistlethwaite, 2015; 'Teaching Anatomy', 2017)From figure no.7, when asked do you think mind mapping helps assembling the facts together, 89% of the respondents thought mind mapping helped.(Dutton and Ryznar, no date; Rubin, 2013; Kannan and Thenmozhi, 2016; Peterson, 2016) While 11% did not think mind mapping helped.Another study talks of teaching in live classes versus online teaching(Larry Peterson, Peterson and Melville, 2008; Amin and Abdulghani, 2015; Chan and Pawlina, 2015; Hafferty and Finn, 2015; Dombe*et al.*, 2016; Mavrych, 2016). (Dutton and Ryznar, no date; Rubin, 2013; Taylor, 2014; Kannan and Thenmozhi, 2016; Peterson, 2016; Darby and Lang, 2019) From figure no.8, when asked do you think labelling pictures online helps to remember details better 84% of the respondents think online activities are efficient while and 16% don't think so .(McHanwell, 2015; Youdas, Krause and Hellyer, 2015; Köhler and Köhler, 2018)

Another study talks about teaching anatomy live in class and compares it with online tutoring.(Amin and Abdulghani, 2015; Chan and Pawlina, 2015; Hafferty and Finn, 2015; Dombe*et al.*, 2016) From figure no.9, when asked do you think problem based solving helps you understand better,92% of the participants agreed that problem- based learning is efficient.(Dutton and Ryznar, no date; Rubin, 2013; Taylor, 2014; Pather, 2015; Kannan and Thenmozhi, 2016; Peterson, 2016; Aktor, 2018; Darby and Lang, 2019) 8% of the participants don't think problem based learning is not required.(Dutton and Ryznar, no date; Rubin, 2013; Taylor, 2014; Kannan and Thenmozhi, 2016; Peterson, 2016) Another study promotes problem based learning in teaching anatomy and considers it to be effective.(Trelease, 2015; 'Teaching Anatomy', 2017; Saverino, 2020) From Figure no. 10,when asked do you think anatomy as a subject is challenging to teach online, 56% of the students thought it wasn't hard to teach online and the other 44% opposed the thought.(Kannan and Thenmozhi, 2016; Peterson, 2016)(Dutton and Ryznar, no date; Kannan and Thenmozhi, 2016; Peterson, 2016)

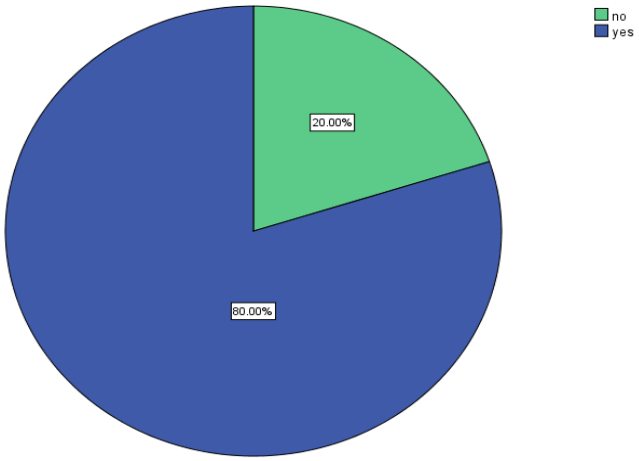

FIGURE 1 Pie chart represents the responses for the opinion whether anatomy is a hard subject. 80% of the participants agreed (blue) that it is hard while 20% do not think it's hard (green).

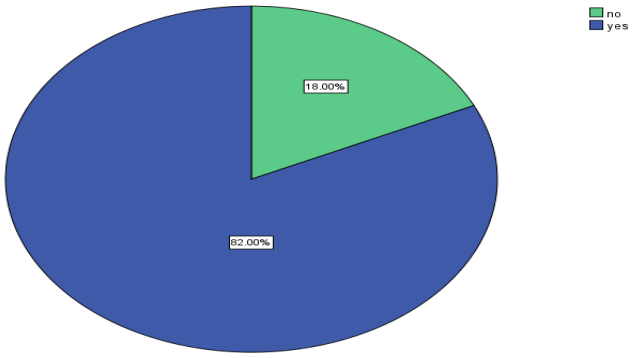

FIGURE 2 Pie chart represents the responses for the opinion whether anatomy as a subject, has a lot of facts to remember. 82% of the participants agreed (blue) to anatomy having a lot of facts to remember while 18% did not think so (green).

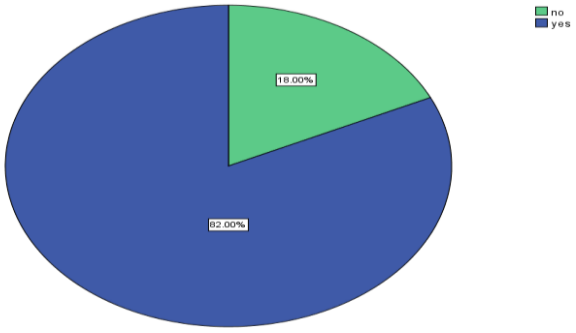

FIGURE 3 Pie chart represents the responses for the opinion that digital aids help visualize topics in anatomy. 82% of the participants agreed (blue) that using digital aids could help visualize topics easily, while 18% did not think so (green).

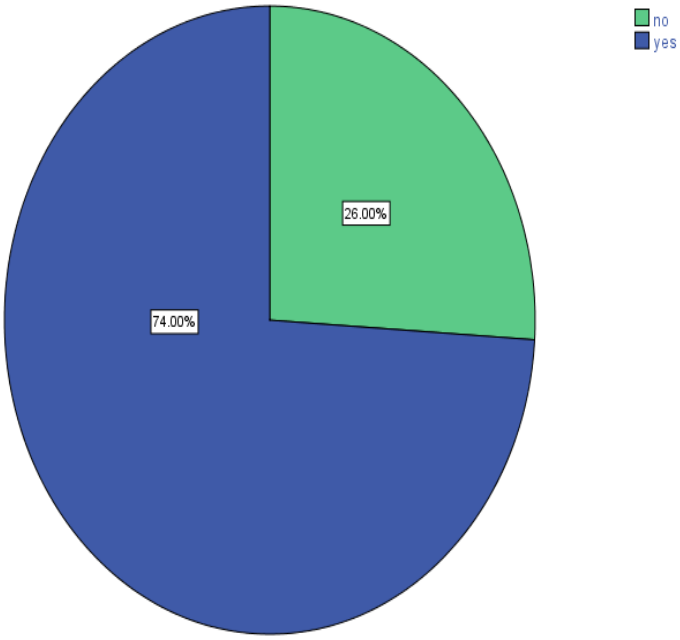

FIGURE 4 Pie chart represents the responses for learning anatomy without the use of cadaver. 74% of the participants agreed (blue) that they can learn anatomy online without the use of a cadaver, while 26% think that they will not be able to learn anatomy without the use of a cadaver (green).

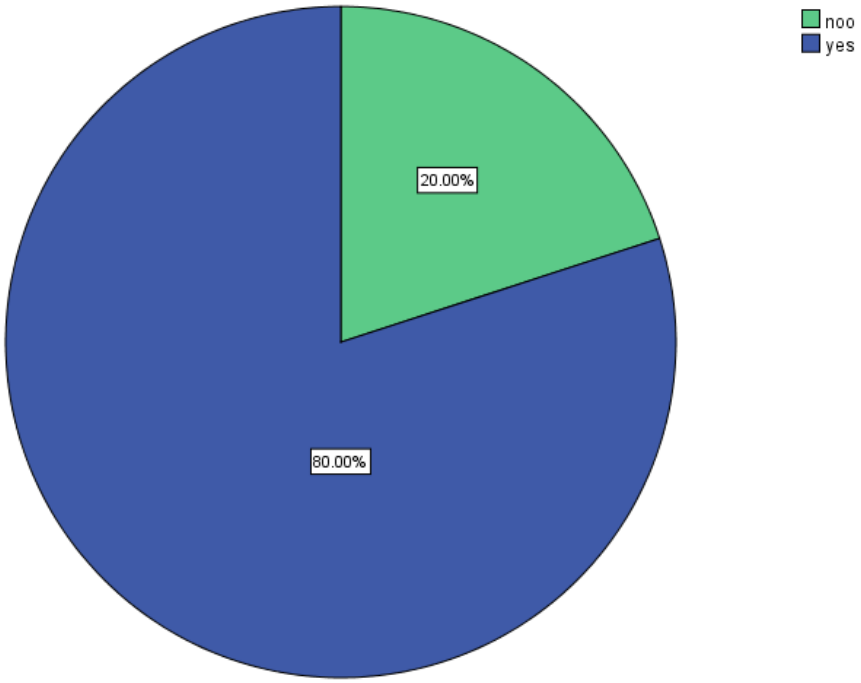

FIGURE 5 Pie chart represents the responses for pictographs to make learning anatomy easier.80% of the participants agreed (blue) that pictographs makes learning of anatomy easier while 20% did not think so (green).

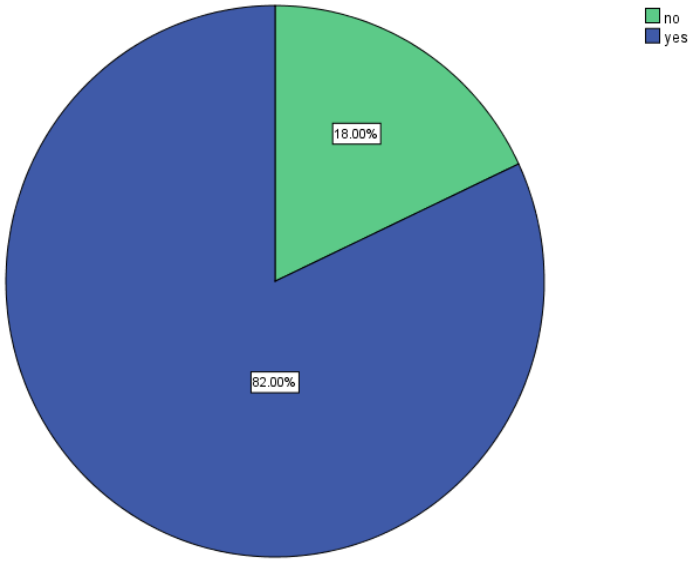

FIGURE 6 Pie chart represents the responses for anatomy calls for regular revision in order to remember the topics. 82% of the participants agreed (blue) that anatomy as a subject calls for regular revision while 18% do not think so (green).

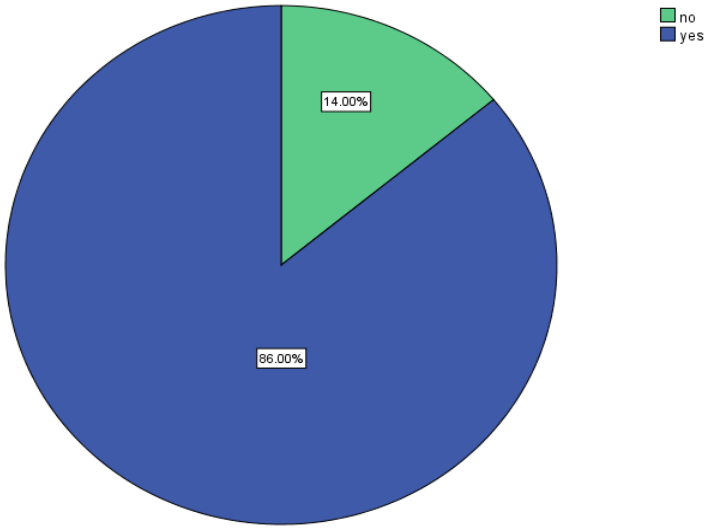

FIGURE 7 Pie chart represents the responses for mind mapping helps put down important points together. 86% of the participants agreed (blue) that mind mapping helps put down the important points together while 14% did not think so (green).

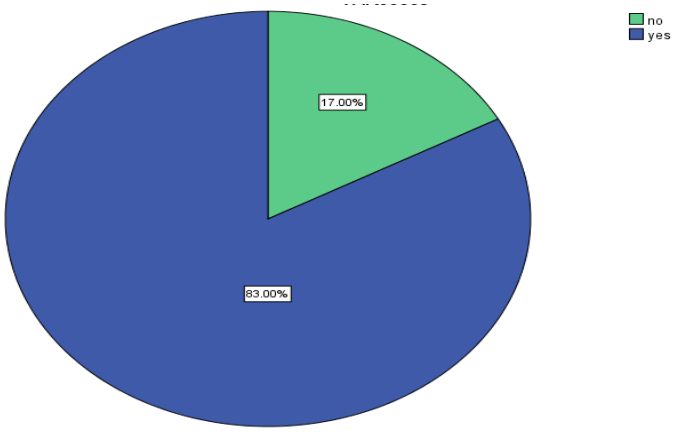

FIGURE 8 Pie chart represents the responses for opinions on labelling pictures helps remembering the details better. 83% of the participants agreed (blue) that labelling pictures online helps remembering the details better while 17% did not think so (green).

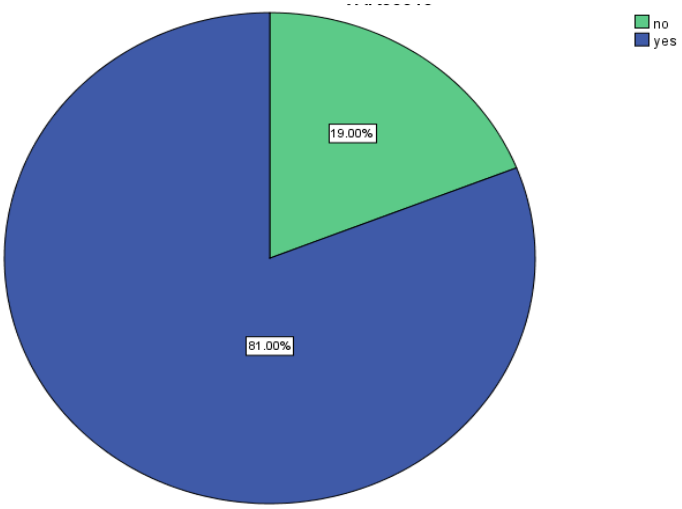

FIGURE 9 Pie chart represents the responses for problem based learning helps understand better. 81% of the participants agreed (blue) that problem based learning helps understand better while 19% did not think so (green).

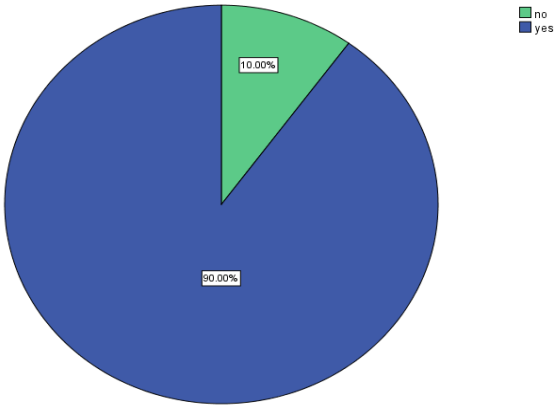

FIGURE 10 Pie chart represents the responses for whether anatomy is challenging to teach online. 90% of the participants agreed (blue) that anatomy is challenging to teach online while 10% did not think so (green).

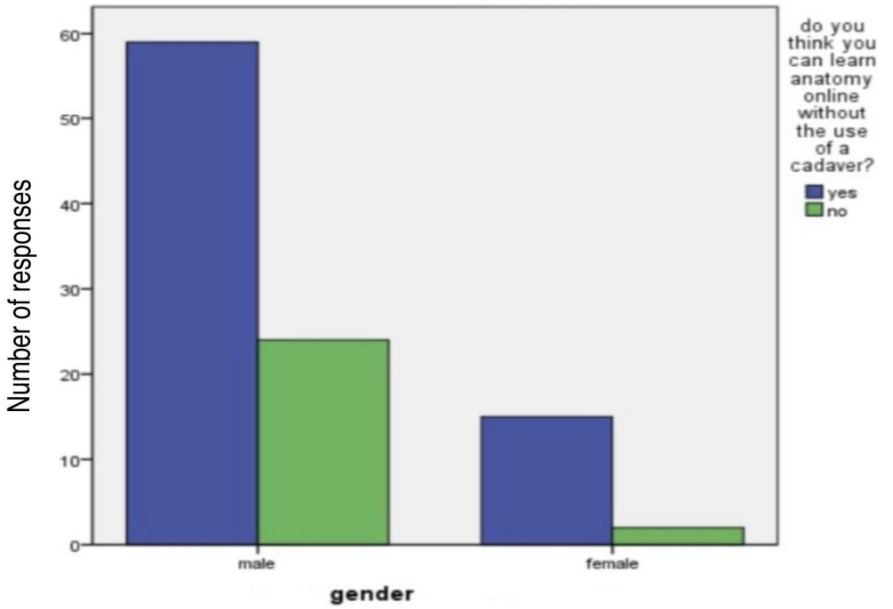

Figure 11 This graph represents the association of gender and their thoughts about learning anatomy online without the help of a cadaver where blue colour denotes 'yes' and green colour denotes 'no'. X axis represents gender and Y axis represents number of responses whether they can learn anatomy online without the use of a cadaver. Out of the 74% participants who think they can learn anatomy online without the use of a cadaver, 60% were male and 14% were female. Hence male participants are more open to the idea of learning anatomy online without the use of a cadaver. Chi square test, Pearson Chi square value is 5.157, dF - 1, p value- 0.0014 (>0.05) was found statistically significant.

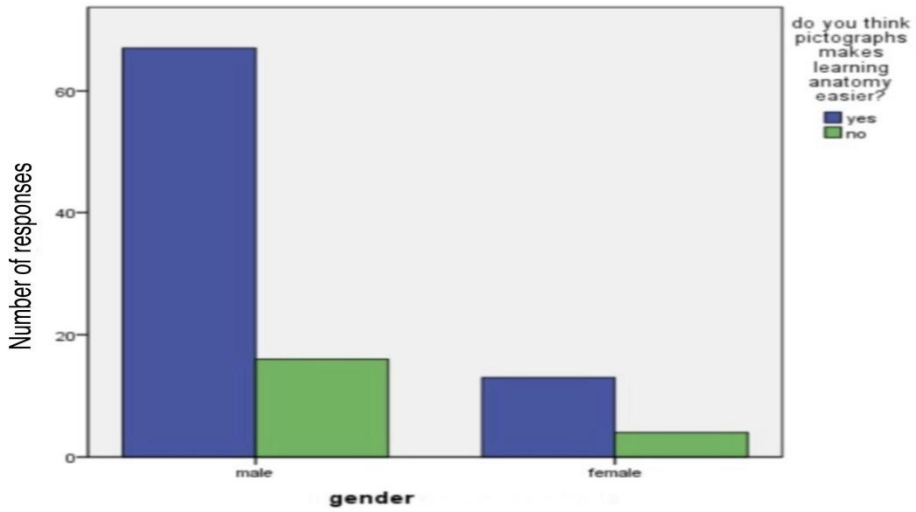

Figure 12 This graph represents the association of gender and their thoughts about whether pictographs make learning anatomy online easier where blue colour denotes 'yes' and green colour denotes 'no'. X axis represents gender and Y axis represents whether pictographs can make online learning of anatomy easier. Out of the 80% participants who think pictographs make online learning of anatomy easier, 64% were male and 16% were female.

Hence male participants are more open to the idea that pictographs make online learning of anatomy easier. Chi square test, Pearson Chi square value is 6.159, dF-1, p value- 0.004 (<0.05) was found statistically significant.

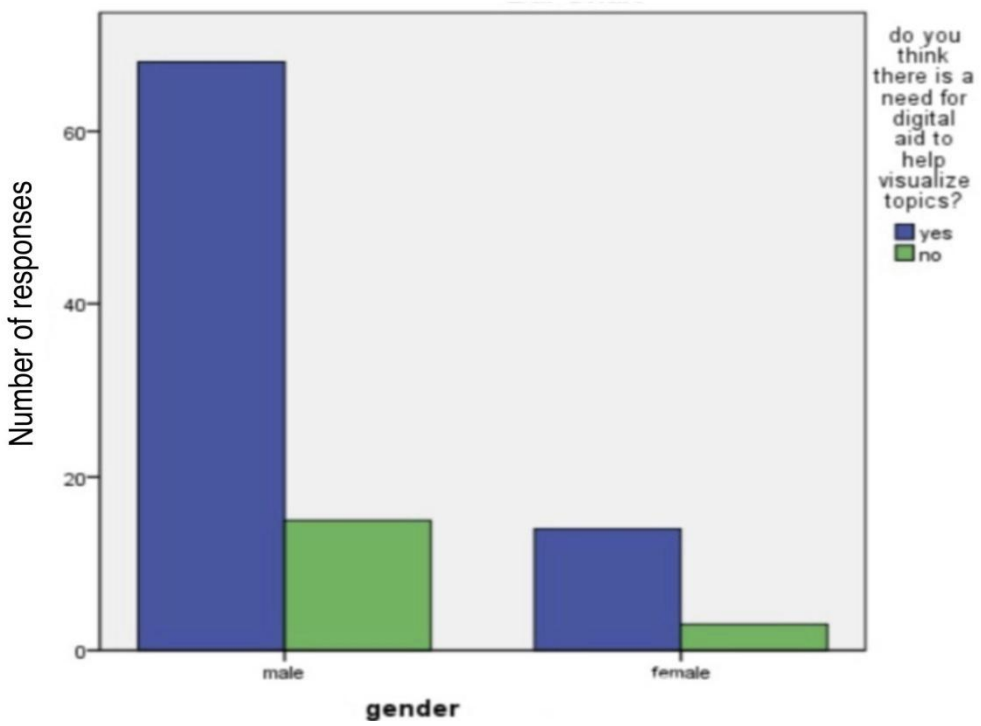

Figure 13 This graph represents the association of gender and their needs for digital aids to help visualising topics where blue colour denotes 'yes' and green colour denotes 'no'. X axis represents gender and Y axis represents whether they need digital aids to help visualise topics. Out of the 82% participants who think they need digital aids to help visualise topics, 65% were male and 19% were female. Hence male participants think they need the help of digital aids to help visualise topics. Chi square test, Pearson Chi square value is 6.902, dF-1, p value- 0.001 (<0.05) was found statistically significant.

CONCLUSION

This study was conducted to understand the collective student perspective and opinions on online teaching of the subject. It also reveals how enthusiastic and open the students are to new, creative online classes. This study was also conducted to assess how challenging the subject anatomy is to teach online, its advantages and disadvantages of online tutoring. At the outset , it is concluded that teaching anatomy through online has its own challenges including a non-cadaveric approach and with lack of physical contact with the models and aids of learning, nevertheless it has its own benefits and provides a mode of learning with better teaching aids using all available technologies.

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