USE OF SOCRATIVE AS A TEACHING TOOL IN ANATOMY DURING THE COVID-19 PANDEMIC

Lennox Francis

Lecturer, Section of Anatomy, Department of Basic Medical Sciences,
University of the West Indies, Mona Campus, Jamaica

ABSTRACT

On March 13th, 2020, in the middle of Semester 2, University of the West Indies (UWI), Mona announced the suspension of classes for one month due to the COVID-19 pandemic. Within days most of the first- and second-year medical students were back in their homes around the Caribbean. Resumption of online teaching was scheduled for April 14th, 2020. This lecturer had been using a free online student response system (SRS) called Socrative to set quizzes for his small Lab tutorial group since 2016 and decided to upgrade to Socrative Pro which had multiple classrooms to set teaching quizzes for first- and second-year medical students. At the end of the semester (2020.S2) a survey was done of 86 second-year medical students. The overwhelmingly positive response of these students to these quizzes led to improvements and continuation of these quizzes.

KEYWORDS

COVID-19 pandemic, suspension of classes, Socrative Pro, Survey.

1. INTRODUCTION

After having some concerns regarding the transition from High school to the demanding curriculum of Medical School for first- and second-year medical students; many students fell behind during this transition. This led me to look at 'Learning support interventions' for these students. The two interventions explored were: "Use of Socrative which is a free, online, therefore real-time, Web platform for teachers to put questions to students through an App on their smartphone or tablet device" and "Use of clickers which was subsequently started as short sessions for all students doing Anatomy Labs".

In 2016 I started using the free Socrative app which was limited to 50 students in one classroom. This was ideal for my Anatomy Lab tutorial group and proved to be quite popular. I would put up 12 MCQs after each Lab, the students did these online and we would discuss the answers at the beginning of the next Lab. This all changed on March 13th, 2020, when I made the decision to switch to Socrative Pro.

2. MATERIAL AND METHODS

Socrative Pro allowed 20 classrooms with 200 students in each and allowed inclusion of pictures of dissected specimens and a discussion with a further image after the student answered the question.

I used the period of the Lockdown to create an image bank of dissected specimens by photographing the dissected specimens in our Anatomy Lab with a cell phone; also getting

BlueLink images from the University of Michigan Medical School. Later when students started requesting histology questions, I was able to access Virtual Microscopy Database (VMD) thanks to Professor Michael Hortsch [1] from University of Michigan Medical School and Professor Haviva Goldman [1] from Drexel University Medical School. Virtual Microscopy Database (VMD) which has virtual Anatomy histology slides contributed by 23 Universities in the United States and around the world.

By the second week of the Lockdown, I started posting quizzes with classrooms assigned to first- and second-year medical students, dental students and students doing BBMedSci (anatomy). The quizzes each had 30 – 50 questions each. The quizzes were kept in online classrooms until examinations. The response of the students was terrific, and this inspired me to continue. Attached are images of 2 questions [Image 1 & 2] including discussions. In the attached images, the information (i) came up after the question was answered and the images could be zoomed by clicking on them.

During the Semester affected by the suspension of classes (2020.S2) eight quizzes were put up for second-year medical students doing Neuroanatomy and Urogenital. There were 2625 student attempts of these quizzes. For first-year medical students doing the Respiratory and Cardiovascular systems six quizzes were posted. There were 1890 student attempts of these quizzes.

2.1. Survey

A survey of 86 second-year medical students was done at the end of this Semester (2020.S2). For this I got significant help from a student in that class. 86 students responded. Four questions were asked in the survey.

Q1. Did you attempt the quizzes? All 86 responders had done so.
Q2. On a scale of 1 – 10 how useful were the quizzes? All 86 responders answered, and the weighted average of the responders was 9.88 [see image 3]
Q3. Do you have any recommendations for future quizzes? 64 responders had recommendations. Most were happy with the quizzes as they were, but some asked for more quizzes, more embryology, more histology and very important they wanted the image in the question, or a related image included with the discussion as this was not always done.
Q4. Asked for General feedback. 72 responders commented and all were positive feedback. One of the responses that inspired me to continue was: “With the most gratitude, I thank you. In all this chaos and confusion, you provided much needed help and guidance. God Bless.

2.2. Material and method continued

More quizzes were constructed over the summer break of 2020 and the students’ recommendations for more embryology and histology included.

For Semester 1 (2020.S1) there were 10 quizzes in 10 online classrooms for first-year medical students on different regions of the Locomotor system. There were 1742 student attempts. For second-year medical students there were 10 quizzes in 10 classrooms on different regions of the Digestive and Endocrine systems. There were 3132 student attempts. These quizzes were put up after they had online lectures and Zoom Labs on the different regions.

For Semester 2 (2021.S2) there were 6 quizzes in 6 classrooms on the Respiratory and Cardiovascular systems for first-year medical students. There were 968 student attempts. For

second-year medical students there were 10 quizzes in 10 classrooms on different regions of Neuroanatomy and Urogenital systems. There were 3188 student attempts of these quizzes.

3. DISCUSSION

Socrative is a powerful and easy to use student response system (SRS). Although it was meant for providing an engaging way to assess students, I have found that Socrative Pro with its added features of including images and discussions, has the potential to support online teaching and Labs. The results of the survey done revealed that most students were very appreciative of the quizzes.

Although the relationship between use of Socrative and possible improvement in test scores has not been clearly established, a study [2] showed that 53% of engineering students at Sheffield Hallam University in the United Kingdom improved their performances by using Socrative. Two other studies [3, 4] found that students 'increased their retention of course material with SRSs' and when Socrative was used as part of a lecture that students felt 'more engaged, motivated and interested in the lecture'.

Several medical schools [5, 6, 7] found that the simultaneous use of Zoom and Socrative to be very helpful during the COVID-19 pandemic. At UWI we have been delivering our lectures on Black Board Collaborate (BBC), our Labs were Zoom sessions and looking at the results of the survey done on the acceptance of Socrative quizzes, I am convinced that this is a useful tool in our teaching during this pandemic.

4. CONCLUSION

There is no doubt that the COVID-19 Pandemic has brought many changes to Pedagogy. Most of us have become more adept at online delivery. The flipped classroom model [8, 9] has been gaining popularity in recent years. For several years, many educators have been concerned about the decreasing numbers of students who attended traditional lectures but would turn up for the Labs which in Anatomy were small groups and there were more interactive discussions with students. Even before the COVID-19 pandemic many institutions had changed to a flipped classroom model. In this model, students watch online lectures, collaborate in online discussions, or carry out research at home while engaging in concepts in the classroom with the guidance of tutor. However, as a group of researchers in Barbados [10] showed recently in developing countries access to ICTs and teacher guidance are important considerations. I was impressed with the student involvement in our lectures on BBC and in Zoom sessions for Labs. When we resume face to face teaching, I hope we would have learned some lessons from COVID-19.

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Image # 1

1. **NB Images can be zoomed if you are using a laptop or a tablet**. These four arrows are pointing at structures that should tell you which chamber of the heart is opened here. **Which chamber is it?**

A right atrium
B right ventricle
C left atrium
D left ventricle

(i). The red arrow is at fossa ovalis. The blue arrow is at the opening of the coronary sinus guarded by the thebesian valve. The yellow arrow clearly shows the tricupsid valve and the green arrows clearly shows the parallel musculi pectinati (pectinate muscles) like the teeth of a comb coming off the crista terminalis.

The only feature shown in Netters image that is not seen in the specimen is the eustachian valve marking the entrance of the IVC as IVC had been opened. You can clearly see the smooth posterior part (sinus venarum) and the ridge-like anterior part. We discussed the embryological origins of both parts in the quiz on external heart.

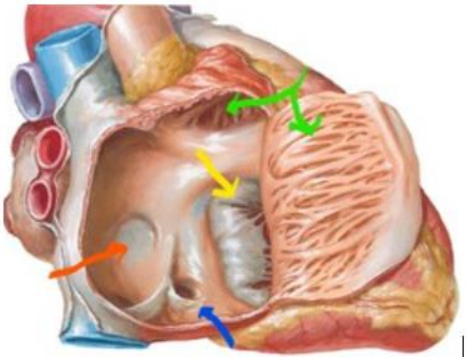
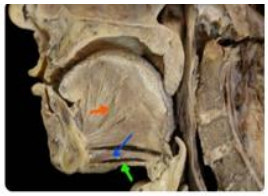


Image # 2

12. You can answer this question from what we have discussed so far. Note the origins of the 3 muscles at the 3 arrows at the mandible.
Identify the muscle at the blue arrow.



A genioglossus
B geniohyoid
C mylohyoid
D anterior belly of digastric

(i). We can see the large genioglossus arising from the superior mental spine and the geniohyoid from the inferior mental spine. The muscle at the green arrow is the diaphragm of the oral cavity or floor of oral cavity; this is mylohyoid.

Attached is an image of the suprahyoid muscles. There are 4 of them: mylohyoid, geniohyoid, stylohyoid and digastric muscles. They play an important role in elevating the hyoid bone when swallowing and when the hyoid bone is fixed by the 4 infrahyoid muscles (omohyoid, sternohyoid, thyrohyoid & sternothyroid) they will assist with depression of the mandible during mastication. The suprahyoid and infrahyoid muscles are also called accessory muscles of mastication.

In attached image the green arrow is at geniohyoid, blue arrow is at mylohyoid, yellow arrow is at stylohyoid and red is anterior belly of digastric.

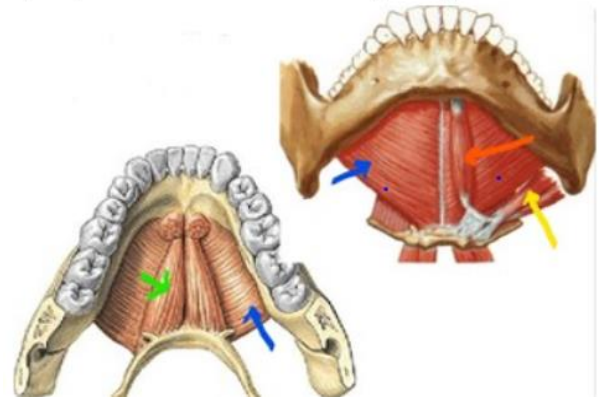
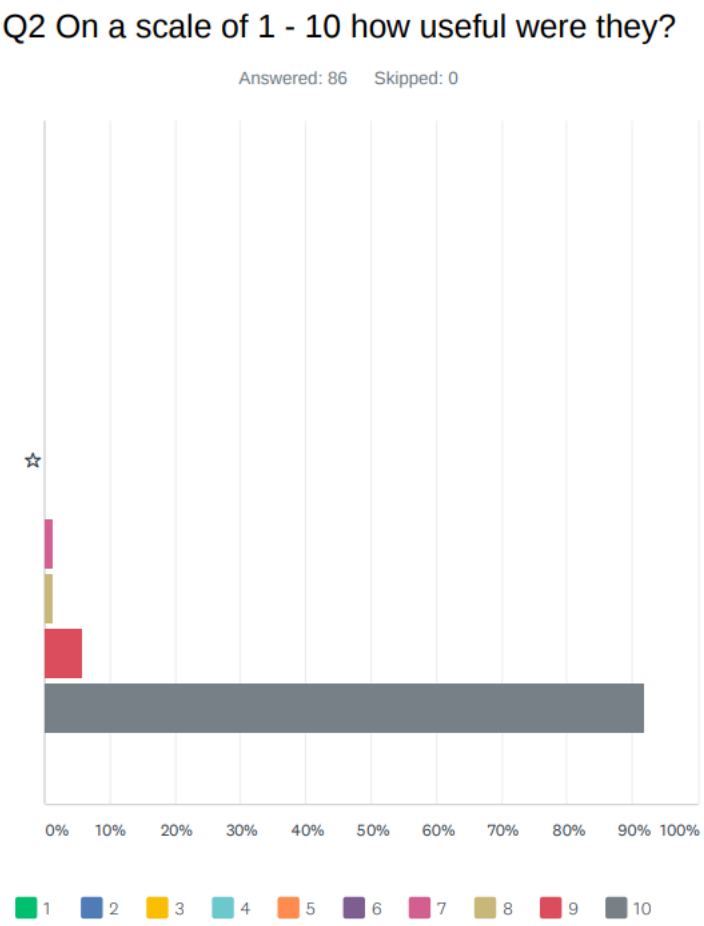


Image # 3



	1	2	3	4	5	6	7	8	9	10	TOTAL	WEIGHTED AVERAGE
☆	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	1.16% 1	1.16% 1	5.81% 5	91.86% 79	86	9.88

Author

Lennox Francis is a retired General Surgeon who has been a Lecturer in Anatomy at the University of the West Indies Mona Campus for the eight years and can be contacted at lennox.francis@uwimona.edu.jm