STUDENTS AS CO-CREATORS

A Learning & Teaching Research Collaboration

"The Future of Live-streaming Post COVID-19"

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1.EXCUTIVE SUMMARY

During the COVID-19 pandemic, the school of life sciences offered practical sessions (Super-pracs) to undergraduate students however, many students would not be able to attend in person due to many reasons (for example, self-isolation, illness, living outside London, family reasons, fear of using public transport, etc.), so the practical sessions were also live-streamed allowing those students to attend online. Moreover, the sessions were recorded. Our project aimed to gather students' feedback about livestreaming and their advantages and disadvantages, so we can improve streaming of the practical sessions post COVID-19 and enhance students' experience. Although some students faced some technical issues such as connectivity problems and poor camera and sound quality, many students appreciated the opportunity of livestreaming the practical sessions as this allowed them to (1) not having to travel to Uni, (2) being able to ask the lecturer questions and (3) access to the recorded session. However, some students found the livestream delivery of laboratory sessions to be much less engaging and felt that they did not learn laboratory skills. Students suggested more engagement is required through having questions and multiple-choice quizzes during and after the livestreaming.

2. BACKGROUND & AIMS

2.1 Background

In the academic year 2020/2021 BSc (Hons) Biomedical Sciences students at the University of Westminster had limited practical teaching due to the COVID-19 pandemic. As an alternative to traditional laboratory sessions, optional practical sessions (Superpracticals) were conducted and they were live-streamed for students who were unable to attend in person. 'The future of live-streaming post-COVID-19' research project was needed to investigate students' perception of the changes in practical teaching which were implemented in response to the COVID-19 pandemic.

Additionally, the literature suggests that live-streaming could be further implemented post-COVID-19, finding this method of learning the most flexible for students (Abdelwahed et al., 2020). Additionally, Camarata et al. (2021) discovered that live streaming practicals alongside on-campus teaching has the potential for improving education in the future. Thus, researching the possible further implementation of online laboratory sessions was important to look into for Biomedical Sciences students at the University of Westminster.

2.2 Aims

The project aimed to discover if students find laboratory live-streamed sessions useful. Additionally, the research team hoped to identify areas for improvement as well as possible solutions that could be implemented to improve practical teaching and live-streaming post-COVID-19.

2.3 Objectives

The aims were achieved by conducting a survey to gather feedback from level 5 Biomedical Science students. Obtained data was then analysed and discussed by the research team.

2.4 Stakeholders

Conducted research will have an impact on current and future undergraduate Biomedical Science students at the University of Westminster. Although participants included level 5 biomedical students only, the intended beneficiaries are biomedical science students across all undergraduate levels including distance learners and postgraduate MSc students. The findings of our evaluation will be used by the module and course leaders.

A STUDENTS AS CO-CREATORS PROJECT
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3. METHODS

A questionnaire was designed in order to gather feedback on live-streamed practical sessions. Both closed and essay questions were included. A survey administration software - Google Forms, was used to create the questionnaire. The final version was shared via email with all level 5 Biomedical Science students. Forty eight students responded to the email and participated in the research by completing the survey. Prizes in the form of 6 amazon vouchers (£50 each) were available for the participants. The prizes were selected via entering participants into a draw post completion of the questionnaire. Students who wished to enter the draw were asked to provide the University email address. Data collected from the questionnaire was then analysed using Microsoft Excel software. Closed questions responses were tallied and reported in terms of frequencies and percentages. Open-ended questions were coded and thematically analysed. Consequently, gathered data was used to write up a project report.

4. RESULTS

4.1 Summary

The survey received 48 student responses. Of these, 45 students attended a livestream session (26 attended in both semester 1 and 2, 10 only in semester 1 and 9 only in semester 2). The other three students attended the practical sessions in-person and did not attend a livestream session. Additionally, there were 3 students that attended the livestream session and also attended in-person in the second semester.

4.2 Connectivity problems

Student and tutors access to reliable internet connectivity at home is something that has been greatly highlighted and study from home during the COVID-19 pandemic. Students remarked on connectivity issues stating *"the camera sometimes froze"* and *"had to refresh tab sometimes"* and *"internet drops"*. A few students remarked on a particular event saying; *"half of the livestream was not online. And "Some problems with connection occurred in the lab and first part of the practical didn't go live… and students were just waiting in the course room. However, the recording has been uploaded".* In such a case, having the session recorded provided students the opportunity to catch up on what was missed, but of course, this prevented live student engagement and interaction at the time of the practical delivery.

4.3 Camera and sound quality

Overall, students gave high ratings (4 and 5) for the camera and sound quality of livestream sessions (figure 1). The Life Science laboratory is fortunate to have high quality camera equipment. However, the sessions are run through Collaborate which dynamically adjusts the sound and image quality depending on the individual connection bandwidth and fluctuations in internet connectivity of the participants. Therefore, the viewing experience of all students is unlikely to be the same and is heavily influenced by the stability of their own internet connection.
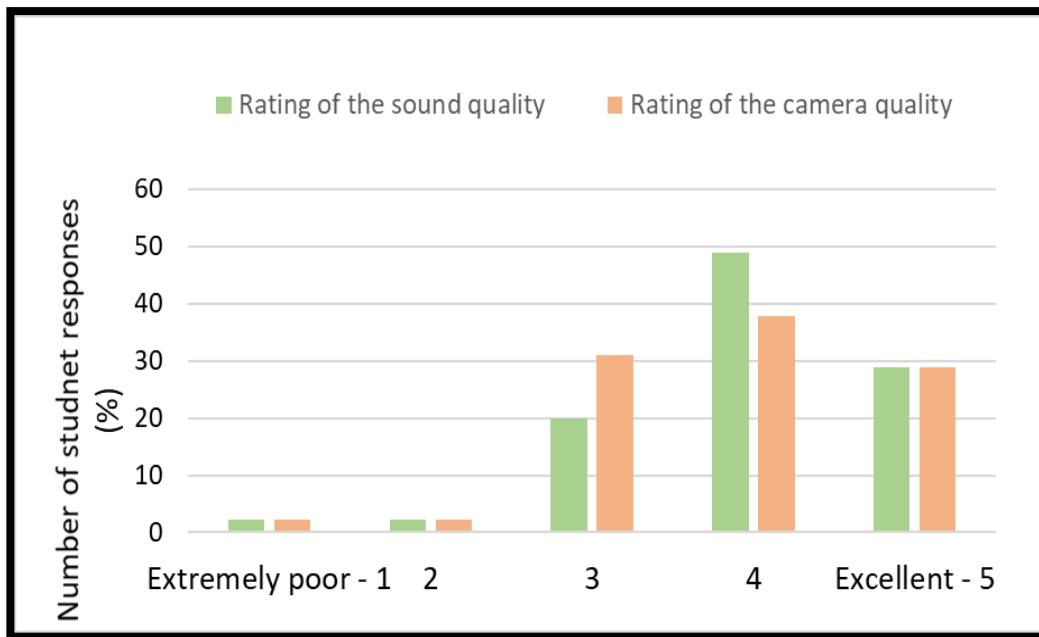
Figure 1. Student rating of camera and sound quality of livestream sessions (n = 45).

4.4 Student perception of the livestream experience on their learning

Of the 45 student respondents that attended at least one livestream session, 29 students indicated that they would like to see livestream sessions continued and 16 students answered 'no' to this question (figure 2).
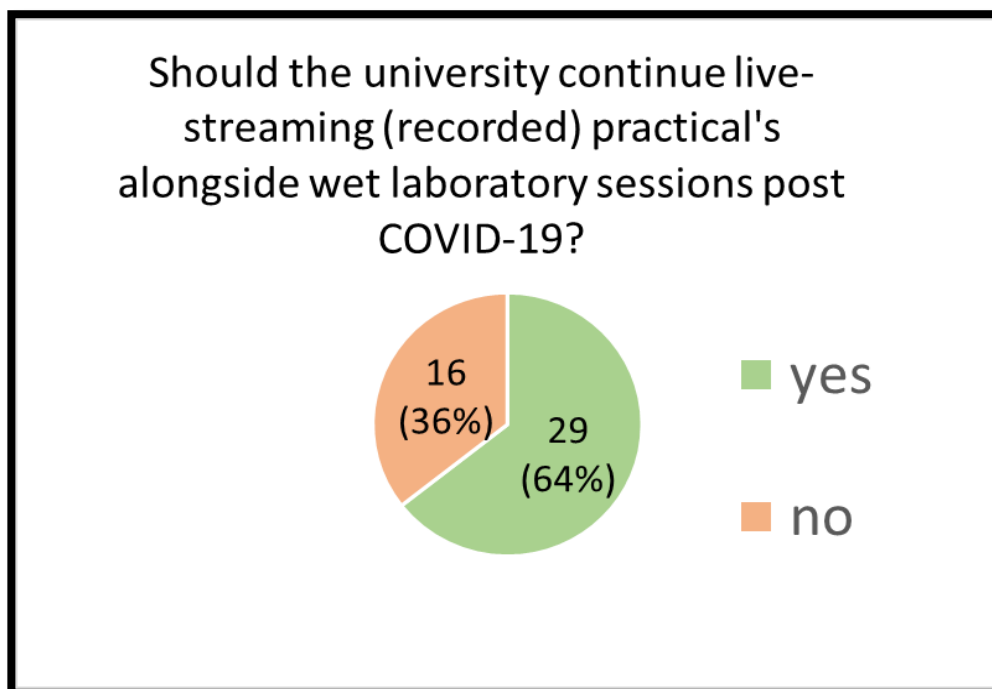

Figure 2. Summary count of students who would like to see livestream delivery continued vs those not in favour of continued.

The group of students that answered 'yes' were overall more positive about the impact of the livestream experience on their learning than the group that indicated 'no' (figure 3). Their choice seems to have revolved around 3 main points; (1) convenience of not having to travel to Uni, (2) being able to ask the lecturer questions and (3) having access to the recorded session. One student in this group commented that "some people may not be able to attend the practical due other reasons, and this will be helpful for them" and another student said *"because you don't need to worry about arriving on time and rush hour"*. Another student stated, *"it's easier to ask questions and the lecturer explains in detail"* and someone else in this group commented that *"it's easier to engage and I would rather watch online and ask the questions I want than to stand in a lab waiting for someone to help or answer my question ... I can rewatch the recording and it's easier to take notes when just watching. If I'm actually doing the practical I find it harder to make notes as we only have a certain amount of time to complete the practical"*. Other student agreed saying *"it's good to be able to rewatch for revision"* and *"having recordings available is very useful and it would also benefit student who are unable to attend the practical"* and *"it will be good to go back and see what was done, ... and understand what went wrong in case the results were not as expected"*.

For the group that answered 'no' to the question of continuing livestream sessions, overall they found the livestream delivery of laboratory sessions to be much less engaging, felt more strongly that they did not learn laboratory skills and did not find livestream delivery beneficial (figure 3). This group also seemed to struggle more with following what was happening in the livestream session, with four different students commenting that; *"it's better to do practicals face to face for more understanding"* and *"when it comes to wet labs, it's much better to get some hands-on experience as I feel this is where the real learning happens"* and *"I think wet laboratory sessions are necessary for our learning and skills development. Live streamed labs are not very helpful and won't offer the same quality of education"* and *"I felt that I did not gain any laboratory skills and was not able to learn any techniques through the live stream. Although in some ways it helped me understand the concept of the practical; it would be more beneficial to get hands-on practice"*.
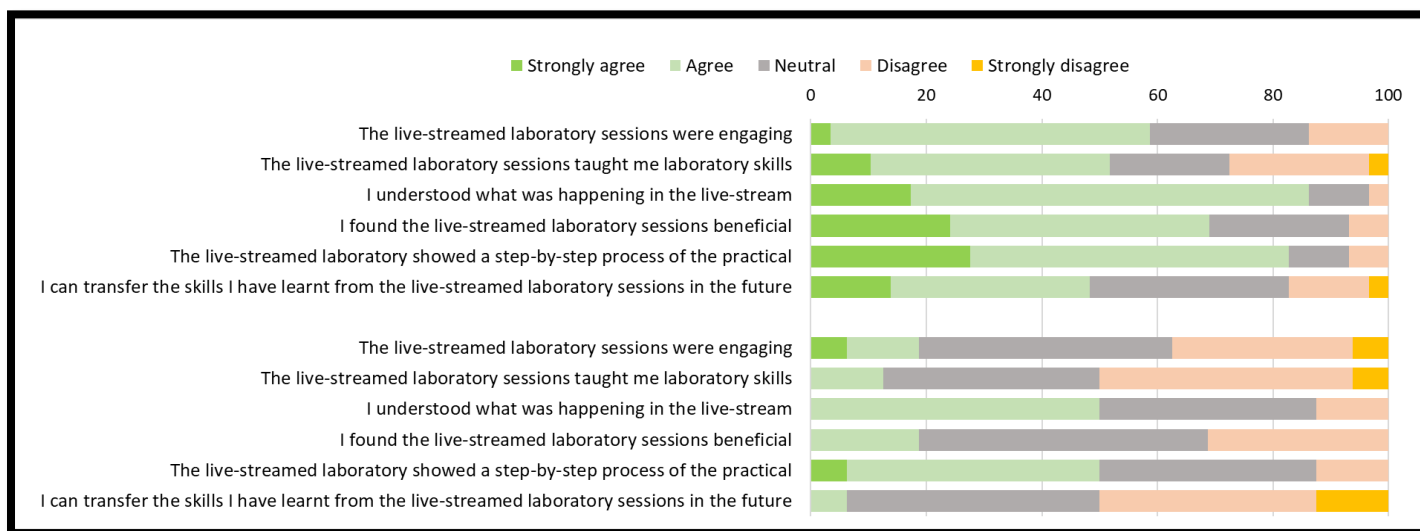

Figure 3. Summary of student experience of livestream.
Top: students in favour of continuing livestream delivery.
Below: Students not in favour of continuing livestream delivery.

4.5 Student perceptions to the suggestions for improving future livestream sessions

Dividing the student into the group that were in favour of continuing livestreams vs those that were not gives some deeper insight to student preferences for improving laboratory livestream sessions.

Students in favour of retaining livestream delivery were overall more favourable to the suggested improvements for livestream sessions. In particular, they were strongly in favour of having a dedicated teaching team just for the livestream session.

The group of students who were not in favour of continuing livestreaming laboratory sessions overall gave more neutral responses to this set of questions (figure 4). They did however show a preference for post-session activities such as having a multiple-choice quiz and access to the recorded session.
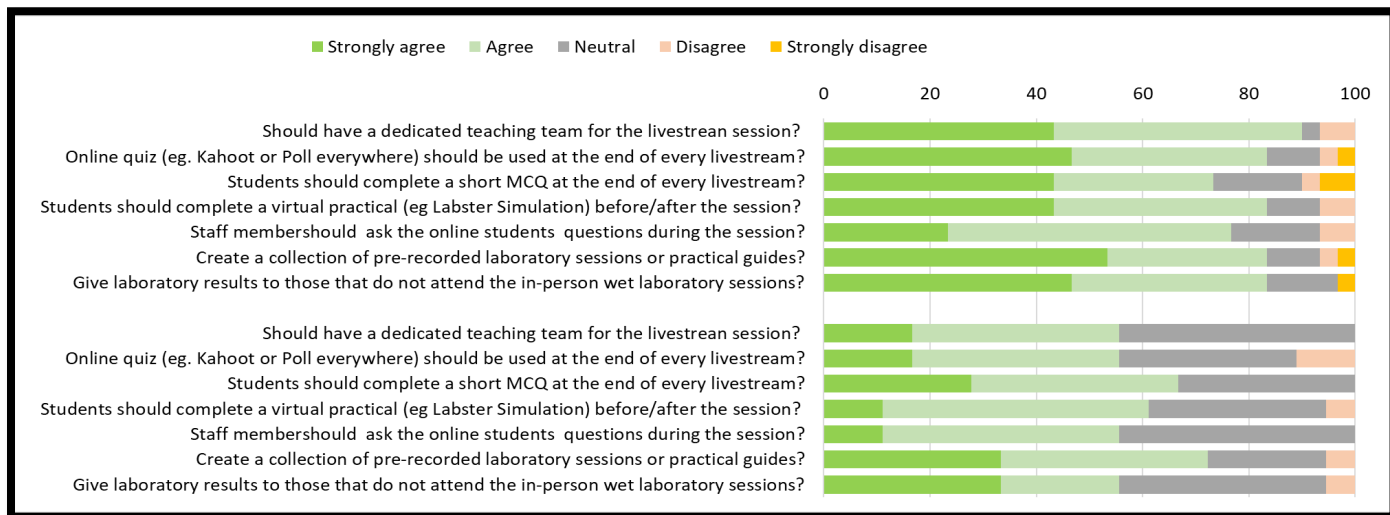

Figure 4. Student responses to suggestions for improving livestream delivery (n = 48)
[note: survey questions have been shortened for the graph].

5. DISCUSSION

Based on our aims, we believe that our results have accomplished the aims as we now know the ways in which students would like live streamed laboratory sessions to be improved to improve their educational experiences as well as their engagement. Majority of the results were as expected as we now have moved to online learning, live streamed sessions are seen as more beneficial and majority of students agreed that it should continue with the slight adjustments such as quizzes and discussions alongside the demonstration to improve engagement and learning. Furthermore, the majority regarded these sessions as beneficial alongside wet laboratory sessions which we predicted, as having recorded sessions to look back on would help students to further verify their understanding; and would also provide students who were unable to make the wet laboratory sessions to have something to engage with. Our findings are consistent with the studies conducted by (Abdelwahed et al., 2020) and Camarata et al. (2021), which found that live streaming practicals alongside on-campus teaching has the potential of improving education in the future and is the most flexible approach to learning for students.

6. CONCLUSION & RECOMMENDATIONS

In conclusion, the majority of the participants indicated that they would like the live-streamed laboratory sessions to be continued. The convenience of not having to travel to university buildings was identified as one of the main advantages of laboratory live-streaming. Additionally, having access to the recorded session was highlighted as a key benefit. However, a number of students find online delivery of laboratory sessions less engaging than wet practicals. Hence, recognising it as a less effective or ineffective way of teaching laboratory skills.

Based on the gathered feedback, it can be proposed to continue live-streamed laboratory practicals in addition to the hands-on experience. It is recommended for the sessions to be recorded as it could benefit students unable to attend live/on-campus sessions. Moreover, access to recordings was noted to be important for students experiencing technical problems. Furthermore, post-session activities could be implemented. For instance, multiple-choice quizzes, which would allow students to revise and test their knowledge on the material covered during the sessions. Additionally, to ensure high teaching quality, a teaching team dedicated just to the live-streamed sessions could be organised.

7. DISSEMINATION

The report will be shared with the head and assistant heads of school and course leaders, so they can read our findings to implement in the upcoming school year.

8. RESEARCH TEAM REFLECTION

Overall, the research experience we gained was highly beneficial and effective; from collaborating as a team to compiling a google form survey for students to provide feedback on our research topic. Everything was successfully accomplished regarding the data gathering. However, some problems we faced were regarding the timing of our project. Due to the fact that our project began as the final semester ended, we would get less feedback as expected, as students would be less engaged with university once the summer began. Therefore, we struggled to get a lot of feedback, as well as accomplish one of our goals which was to conduct a practise live-streamed laboratory session implementing the new feedback we gathered and to do a further survey on whether the new implementations improve learning and engagement amongst the students and teachers. We had to cut our project shorter, but we overcame this by using the feedback we got for further analysis to help future implementation, and hopefully the feedback will be acknowledged and used to further improve students' educational experience. We learnt a lot of valuable lessons such as: data gathering, statistical analysis, team collaboration, logical thinking and time management, and thoroughly gained useful skills.

8. ACKNOWLEDGEMENT

REFERENCES:

Abdelwahed, A. et al., (2020). Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open*, 10(11), e042378. Available from https://pubmed.ncbi.nlm.nih.gov/33154063/

Biswas, P. et al., (2020). Online Laboratory Experiment Learning Module for Biomedical Engineering Physiological Laboratory Courses. *Biomedical Engineering Education*, 1(1), 201–208. Available from https://link.springer.com/article/10.1007/s43683-020-00034-9

Camarata, P, J. et al., (2021). Live-Streaming Surgery for Medical Student Education - Educational Solutions in Neurosurgery During the COVID-19 Pandemic. *Journal of surgical education*, 78 (1), 99-103. Available from https://pubmed.ncbi.nlm.nih.gov/32747320/