ASCILITE 2023

People, Partnerships and Pedagogies

Labs, Field Trips and Tours during ERT: Insights from a New Zealand Specialist Land-based University

Victoria Rosin, Victoria Westbrooke, Xiaomeng Lucock, Alison Bailey
Lincoln University

Student and lecturer insights gained on the pedagogical practices used during Emergency Remote Teaching (ERT) for laboratory, field trip and tour practices, should be used to inform and improve in-person and online higher education programs for the traditionally practical-based courses of agriculture, horticulture and food. Qualitative lecturer focus group data was thematically analyzed and used to develop the online student survey. Quantitative and qualitative data were collected in mid-2021 from the online survey of students. Survey qualitative data was thematically analysed and used to validate and expand on the quantitative data descriptive statistics. Findings revealed that agricultural classes with practical components can be transitioned to deliver some material online to provide additional benefits that enhance the practical components, adds to existing material, and provides benefits in the understanding of that material for students. To transition these components well requires time, funding and online pedagogy professional development to be successful.

Keywords: Online Practical Learning, Pedagogical Practices, ERT

Introduction

This research examined what pedagogical practices worked well under COVID-19's Emergency Remote Teaching (ERT) format for students of agricultural, horticultural and food courses that contained practical components including laboratories, field trips and tours. The research focused on two key questions. What were the impressions of students and instructors when courses were modified and practical components were delivered through different digital technologies in the rapid change to ERT? Most importantly, what pedagogical practices should be maintained for current courses with laboratories and field trips/tours, no matter the format used to deliver the course material?

Background

This study took place at a small tertiary teaching institution in New Zealand. Coursework in the agricultural, horticultural and food course areas include numerous guest lectures, laboratories, half and full day field trips, alongside multi-day tours during semester breaks. Through these activities, students benefit from real life contact with farms, farmers and agribusiness professionals. Like the rest of the world's Institutes of Higher Education, the University switched to ERT on March 23, 2020. What the University did follows the definition of ERT, as a "temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances" (Hodges et al., 2020, para. 13). Lecturers had three days to revise their in-person classes, laboratories and field trips/tours to be available online through the Learning Management System (LMS). For this paper, online is defined as "education being delivered in an online environment through the use of the internet for teaching and learning" (Singh and Thurman, 2019, p. 302). The requirement to move to teach online quickly caused major changes and challenges for these courses. The focus was not on how to design this change well, but on providing what material could be provided online and creating alternative additional material within that limited timeframe where possible. The practical experience learning component of laboratories and field trips/tours struggled to adapt as no in-person learning was permitted and there was little time or resources to develop material that could replace that learning. Once the initial transition phase ended, and some instruction could return to in-person, students in agricultural, horticultural and food courses were surveyed on what they found useful or not in their ERT modified online courses. Lecturers took part in a focus group discussion and their comments were thematically analysed for their impressions of using only online tools and how they coped with delivering practical elements without being in-person. The goal

was to review what techniques or processes could be used in future courses, no matter what delivery form the course took.

Methods

Lecturers who taught the surveyed courses during Semester 1, 2020, were invited to a focus group workshop. Twenty-one lecturers attended the focus group session and were recorded discussing ERT teaching practices in 3 groups of 6, 8, and 7 individuals that were all managed by a moderator. The comments on their experiences with online laboratories and fieldtrips/tours are used in this paper. The focus groups' recorded discussions were transcribed, coded into themes and used to develop the student survey. From the focus group themes, survey questions were developed and then tested for content and face validity by members of the research team. A topic expert reviewed and validated a draft of the student survey. The survey was comprised of both closed and open-ended response questions. All students who took a course in agriculture, horticulture and food subjects during the first half of 2020 were asked to participate in the online Qualtrics survey that was sent via an email link. The 35 courses surveyed included sub-degree diploma, bachelors, honours and post-graduate level classes. Of the 973 students emailed, there was a response rate of 12.8%, which met the sample size confidence level of 95%, with an error margin of 7.7%. For this paper, the student survey responses on laboratories and field trips/tours are used. The survey was conducted after grades were completed. As both types of data were collected within one survey instrument, a Triangulation Design-validating quantitative data model was used (Creswell, et al., 2003). In this model, open ended questions are created as supplementary to a quantitative survey. The qualitative findings are used to validate and expand on the quantitative descriptive statistic results. Quantitative data from the student surveys helped to support or negate the themes that emerged from the qualitative data. Data was collected mid-year of 2021. Permission to survey students and interview lecturers was granted by the University's Human Ethics Committee.

Results

What happened in the courses?

When students were surveyed on whether the three courses they had in S1 2020 were able to provide the planned laboratories and fieldtrips/tours, 87% indicated that their courses had some or full cancellations of laboratories and field trips/tours. Only 13% of students indicated their courses were able to provide the planned laboratories or field trips/tours. Lecturers had to quickly improvise ways to provide online alternatives to the in-person laboratories and field trips/tours. The student survey data indicated only 18% of courses could provide an alternative online version of laboratories and field trip/tours. In part due to the Level 4 lockdown restrictions (New Zealand Government, 2022), 27% of courses with laboratories and field trips/tours were not able to provide a replacement of any kind. The courses that could provide some materials for those course components used the Learning Management System (LMS) as the way to provide students with replacement materials. Using the LMS for distributing materials is reflected in the literature with other universities doing similar adaptations (Barnes et al., 2021; Jeffery & Bauer, 2020). Due to the dominance of practical experience components in courses at this University, modifications to laboratory work and field trips/tours were a struggle for lecturers to provide. As in other COVID studies, lecturers put what they could on the LMS and modified or dropped student requirements (Chierichetti & Backer, 2021).

Laboratories

To adapt some laboratory requirements, lecturers stated they video recorded laboratory experiments and/or procedures for students and uploaded them to the LMS. Lecturers noted that a recording allowed all students in a class to have a good view of proceedings which may not be possible in a large lab setting. One lecturer noted that the laboratory procedure videos they made were good and would be used in future classes. Other lecturers videoed a small experiment for students to gather data and then worked on interpreting the information with an online discussion of results to help students understand the laboratory outcome. Students found the videos useful as they could rewatch the 'how to procedures', and the recordings allowed them to both take notes they missed and ensure that they understood the material. A student described the benefit of learning material online as 'We had good explanations for laboratories. I liked that we could re-watch the laboratory explanations to make sure we understood. I can't always keep up in class, so the recordings are good.' Lecturers and students indicated that a negative to only

viewing the laboratory was not being able to apply the procedures shown. Not being able to practice a procedure, may have consequences for future laboratory work.

As many students were at home during lockdown, some lecturers were able to modify laboratory work and direct students to do some procedures locally by using their phone camera to record what they did. One lecturer noted they had students do, 'easy stuff you can make with your phone camera. I had students use their phone camera to ID plants, no matter where they were living. Told them to use the supermarket if in the city.' Another lecturer modified their animal welfare laboratory to look at local sheep, and modeled with their own flock. One lecturer had engineering students design and make something using items they already had at home. The benefit to this laboratory was seen by the lecturer as, 'How they [students] picked something out, that was the real impact.'

The very practical components of the agricultural, horticultural and food subjects within this study made it particularly challenging for many lecturers to transition the laboratory courses quickly to an online format. Lecturers noted there was no budget to modify their materials and some resorted to providing materials at own cost. Some laboratory sessions required specific equipment like a microscope, which students did not have at home. Other lecturers used the material directly from the printed laboratory manuals without the usual supplementing of the material, which the lecturers and students found 'boring'. To add to the laboratory material issues, some international students were in their home countries and could not access the YouTube videos lecturers used. Then, after the work of making/finding a video, a few lecturers noted some students did not watch the videos for the laboratory.

Field trips/Tours

In-person field trips/tours were replaced by several formats, including the field trip/tour host providing information in a recorded lecture, a Q&A session with the lecturer and/or the field trip/tour host, information found on the web, or a video recording from the field trip/tour site. Lecturers noted that students found it easier to find the information required for assignments associated with the field trip/tour as it was being provided for them rather than having to be extracted by them at the field/farm site. As extracting information is a skill they will need in their professional lives (Westbrooke, et al., 2019) less practice of this skill is concerning to lecturers.

Some lecturers noted that there was a benefit to online field trips/tours as new course material had to be created, and for some lecturers this necessity helped update their course materials. It also led to the lecturers sourcing material that in the future would provide additional benefit and complement an in-person field trip/tour. Students also indicated they appreciated the ability to be able to rewatch and go back to the provided field trip/tour materials. Having online materials available for students' field trips/tours was not easy for lecturers to provide yet 82% of surveyed students agreed that they did learn something doing an online field trip/tour but would have preferred the actual in-person component when possible.

Even though surveyed students indicated they had learned something with the online field trips/tours, they also felt that they missed key learning opportunities that these course components provided. Most students, 76%, felt that they had missed 'a lot of learning' due to not having the in-person laboratories and field trips/tours. As a student wrote, 'It's not the same experience [online], being able to get out in the field and on farm helps to solidify what you've been learning cause it all comes to life, not just through a screen.' Another student noted, 'Because although we can do most learning through theory it is the practical days and labs that help develop further understanding of the concepts learnt in class.' These statements are consistent with other ERT studies that found students felt they missed key aspects of learning when not doing the practical aspects (Jeffery & Bauer, 2020).

In-person learning was seen as more social and to many students, online field trips/tours lacked the social aspects. Students' survey comments indicated that the practicality of the experiences and hearing of past years' students' experiences, increased the feeling of 'missing out'. Lecturers also thought their students missed the applied learning and social impromptu questions on trips/tours. A lecturer stated, 'it's also the questions that organically pop up at the time [during a trip/tour]. You go off script, but it's so relevant.'

Lecturers also thought that showing a range of farms to students was greatly impacted as actually experiencing the differences in farms was not possible through the photo/video replacements. As lecturers assume that students do not have backgrounds in the variety of farms possible, the trips/tours provided that background. A lecturer said, 'what

has come out of research is that when students go out to do farm consulting, they need to see a range of farm systems. A range. And that's the whole thing good, bad, ugly, big, small. So, there's no range.'

Lecturers did find that it was difficult to locate videos with a New Zealand context, and this issue limited what they could supply to students for field trip/tour replacements. Other lecturers tried to create their own videos, but found they lacked the time and skill to create an engaging video for students. One lecturer indicated that they found their created field trip video 'boring' and understood why students did not watch it. Another lecturer stated that the sensory impact of being on a field trip/tour was missing when it took place online. Students could not smell or hear what it was like in the field or packaging warehouse to create a memory sensory-based learning point.

Students and lecturers did report the same benefit with the online learning activities for field trips/tours; online took less time than the in-person versions, within the constraints of having to create ERT material. One student stated, 'Trips and tours take up lots of time. The virtual ones where we could have farmers visit us in lectures with video footage of their farms were very effective and allowed us to re-watch them if we missed any info.' As there was no need to travel, students also noted that even though they 'missed out' on the practical experience, they gained time back, which helped compensate for the 'missing out' on the trips/tour. Lecturers also noted they did not have to go on a tour during course breaktime, which freed up their time. There was also the benefit for lecturers of the reduced administration around preparing for field trips/tours.

Conclusion

For the Future

Due to New Zealand's quick lockdown, there was little time for the University to quickly replace all its practical experiences. Students at this university expected practical components in their courses, and some items that were adapted to online versions were successful at stimulating students' interest in learning. The challenge remains, however, to turn all the traditional practical components into effective learning experiences for the future. Preparing the practical components would initially take time for the lectures, in addition to upskilling in online pedagogical practices and require funding by the university. Going forward, this study revealed there are benefits for lecturers and students alike if the lessons learned are employed.

Students and lecturers have indicated that using online components in a course can expand students' learning experiences when they are done well. Lecturers need the time to develop and create the materials that they know work for students and increase their learning. This study found students used videos to rewatch and acquire information that is often missed during the first viewing, increasing their understanding. Other online material can be used to enhance the in-person experience. As teaching is back to in-person and research is a large priority, less time is used for online resource creation. The lessons on the usefulness of the online components should not be forgotten nor left to a future date.

As many lecturers and students had to learn to navigate the online tools quickly, having professional development opportunities to enrich how students learn online and how lecturers teach using online tools is required. Lecturers require training and/or upskilling in online pedagogy to learn how to incorporate their materials on an LMS site so they can provide opportunities for students to put learning into practice – not just in the lecture theatre, but also online and beyond. Students need opportunities to engage and re-engage inside and outside of the class, through the opportunity to undertake a variety of engaging online activities. Lecturers require the pedagogy to know how to make those opportunities happen. Lecturers also need support and equipment from IT professionals to record and edit a quality piece that is reusable for the future and useful to learning. Pedagogical professional development is something that should be prioritised by university leadership so that there is not a scramble the next time disruptions to in-person learning occur.

As time and resources are needed to create the learning materials, funding is also required. Many lecturers spoke of creating resources, but paying for it themselves. Funding will be a large barrier to creating the engaging online learning resources that lecturers know assist in learning and that students request. University leadership should look for ways to allocate funds needed to develop and create the resources that help lecturers engage students within and beyond the classroom.

As a result of COVID-19's ERT practices, students expect an education supported by comprehensive and valuable online material. As tertiary learning has adapted to using more online components, using the pedagogical practices of what worked well during ERT to enhance learning for students should be maintained. Even though many found ERT difficult and in some cases boring, the provision of online quality material to support and enhance in class learning and the practical elements associated with courses should be possible if the lessons learnt are applied. As ERT is beginning to fade, the lessons learnt should not. As a student noted, 'ERT classes should not end even after covid [*sic*] has been dealt with. A hybrid of the face-to-face classes and ERT is, and will be, beneficial.'

References

Barnes, T., Ramsey, W., & Dunlap, K. (2021). Rapid online teaching: Movement of animal science courses online during COVID-19. Case study: Pedagogical decisions in transitioning animal science courses online. Translational Animal Science, 5(1), 1-6. doi:10.1093/tas/txaa235

Chierichetti, M., & Backer, P. (2021). Exploring faculty perspectives during emergency remote teaching in engineering at a large public university. Education Sciences, 11(8), 419-451. doi:10.3390/educsci11080419

Creswell, J., Plano Clark, V., Gutmann, M., & Hanson, W. (2003). Advanced mixed methods research designs. In A. Tashakkori and C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research,* (pp. 209–240). Sage.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). *The difference between emergency remote teaching and online learning.* Educause Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Jeffery, K. & Bauer, C. (2020). Students' responses to emergency remote online teaching reveal critical factors for all teaching. Journal of Chemical Education, 97(9), 2472-2485. https://doi.org/10.1021/acs.jchemed.0c00736

New Zealand Government. (2022, June). *History of the Covid-19 Alert System - Alert Level 4.* Unite Against COVID-19, New Zealand Government. https://covid19.govt.nz/about-our-covid-19-response/history-of-the-covid-19-alert-system/#:~:text=Alert%20Level%204%20%E2%80%94%20Lockdown

Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018), American Journal of Distance Education, 33(4), 289-306. doi:10.1080/08923647.2019.1663082

Westbrooke, V., Gray, D., & Kemp, E. (2019, March 3-8). *Training farm management consultants: A case study from New Zealand*. [Paper presentation]. IFMA 22: 22nd International Farm Management Congress, Launceston, Tasmania, Australia. https://www.ifma.network/congresses/proceedings/pr-training-farm-management-consultants-a-case-study-from-new-zealand/