Online Lessons During the COVID-19 Pandemic: What Technology Can We Continue to Utilise?

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Abstract

This paper focuses on what can be learned about utilizing technology from the abrupt change to online teaching in 2020 as a result of the COVID-19 pandemic. It uses teacher observations and the results of a student questionnaire to give evidence to support any positive changes that can be made. The paper focuses on teaching methods and practices involving the use of new technology, such as Learning Management Systems (LMSs). During the 2020 COVID-19 crisis lecturers were suddenly forced to switch from face-to -face classes to online teaching and learning platforms. To circumvent the challenges of not meeting students face to face, innovative new methods of teaching and technological advances were used for presentation, interaction and communication. After analysis of the results of the student questionnaire the use of Google Classroom, as an LMS, was shown to be beneficial for students. Finally, the paper discusses whether the technology and practices could continue to be adopted and used to improve learning even after the COVID-19 situation allows us to return to the classroom and face-to-face classes.

Keywords: LMS, online teaching, technology.

Introduction

The education sector, like many industry sectors, faced severe disruption due to the outbreak of COVID-19. In April 2020, 90.7% of the Japanese higher education institutions (HEIs) postponed the start of spring semester classes (MEXT, 2020). Most of these HEIs made the decision to switch from face-to-face classes to online learning. By July 2020, 83.8% of Japanese Universities were employing distance learning (MEXT, 2020). Many educators felt anxious, confused and unprepared due to a lack of the pedagogical knowledge or experience necessary for online teaching (Bao, 2020; UNESCO, 2020). They found themselves facing new challenges such as the digital delivery of content, conducting real time interactive online lessons, testing, presentations and other forms of assessment using online platforms. In addition, other issues arose such as ensuring students could participate in beneficial interactive communicative activities, facilitating practical and efficient means of communication between students and teachers, collection of assignments and providing feedback both verbal and written.

It was not only the faculty alone that felt untrained, inexperienced and unprepared by this sudden move to online learning and the use of new technology; many students were also unprepared in terms of technological experience, knowledge and skill. The MEXT prioritized increasing the digital literacy of Japanese learners in 2010 and created an extensive policy to achieve this goal (MEXT, 2010). However, the Organization for Economic Co-Operation and Development (OECD)'s skills outlook report for 2015 rated the information and communication technology (ICT) skills among secondary level Japanese learners to be the lowest of all developed nations and only three out of five students claimed they had used computers at school (OECD, 2015). Murakami (2016) concluded that numerous institutions at the secondary and higher education levels were not implementing the actions needed to realize the goal of increased computer skills. As a result, many students were in an unfavorable position to deal with the e-learning systems, which became vital

because of the COVID-19 situation (Rentner & Apple, 2020).

Facing these challenges, HEI lecturers, such as the author of this paper, had to adapt their syllabi and teaching methods. Through research and the sharing of knowledge with colleagues, pedagogical practices were adapted, and new technology was employed such as the use of LMS, online testing platforms, video conference platforms and presentation software to meet the requirements of the courses and the learning needs and goals of the students and the subsequent instruction objectives. This paper will attempt to analyze data from a student questionnaire, along with teacher observations, to answer these research questions:

1. Which technological applications, software or LMS were most effective in an online learning situation?
2. Could this technology also be used to improve the efficiency of face-to-face classes in the future, in terms of pedagogical and administrative augmentation?

Literature Review

Whilst it is far from possible for Computer Assisted Language Learning systems to replace teachers/Human Assisted Language Learning, the development of new computer technology, software and applications within the field of language study has led to a rethinking of the roles of and relationship between technology, educators and learners (Reinoos et al., 2010).

One interesting metaphor for the introduction of new technology to a language teaching environment is the *ecological perspective* (Zhao and Frank, 2003). In this perspective, the school or HEI could be described as a biological ecosystem such as a lake. The lake has an *internal equilibrium* created through the harmony of unchanging or inorganic entities, such as the number of and location of computers on campus, the grading system or the subjects being taught and organic species, which would include the students, the teachers and the administrative staff (Zhao and Frank, 2003, p.812; Colpitts et al., 2020). The use of a new piece of technology, such as an LMS, software or an application is like a new species invading the ecosystem (Zhao and Frank, 2003, p.812). For an exotic invasive species to prosper it must be able to work in alliance with the existing species and interact to create a new equilibrium. Colpitts et al. (2020) describe the situation with a Darwinian standpoint: A certain number of technologies will flourish and create new variant generations due to their perceived value. However, those decided to be of little or no use will not survive. Faculties are viewed as being resolute and logical deciding authorities, their ultimate decision about the new species (e.g., innovations in technology) is related to their perceived synergy and their interaction with other species (Zhao and Frank, 2003, p. 817; Frank, 2002; Colpitts et al., 2020) such as the learning environment of the classroom, their students, grades and the learning goals.

One tool that allowed teachers to make and continue to keep in contact with their students during the COVID-19 crisis was an LMS. Szabo and Flesher (2002) describe LMS as the underlying system that steers every facet of the learning process. One example of an LMS system used in education is Google Classroom, which is the LMS used by the researcher and focused on in this study. LMS are administrative online platforms used by teachers to create and manage a course. They can allow the administrator (teacher) to perform operations such as sharing materials (text, audio and visual) with students, communication, giving and returning assignments, testing, assessment, instant feedback and calculation of grades. The administrator invites students to enroll in the class, so unapproved users cannot access it. Therefore, LMS provides a secure and reliable medium for communication with students.

LMSs have been rapidly growing in popularity since their emergence in the 1990s and have become a prevalent component of HEIs around the globe. Whilst estimates in a paper by Dahlstrom et al. (2014) claim 99% of American HEIs provide some form of LMS, only 85% of faculty claim to use them and only 56% state they use them daily. The same study referring to students stated that 83% said that they use LMS and only 56% said they use one in all their courses. However, according to Murakami (2016), despite moves by MEXT to assimilate ICT more into higher education, utilization of LMS in Japanese universities continues to be low and a significant number of students are unaware of what an LMS was at the time of matriculation.

During the COVID pandemic, LMS provided teachers with the technology necessary to distribute materials necessary for students to take part in both synchronous and asynchronous classes when meeting face-to-face had become an impossibility. In the same circumstances, video conferencing services such as Zoom allowed synchronous interaction to take place between the teacher and the class and between the students themselves. The use of a synchronous element in classes, such as Zoom can help facilitate a feeling of community and social interaction and reduce feelings of isolation (Lowenthal et al., 2017). During the pandemic, Nishikawa (2020, as cited in Maekawa, 2021) noted that students, especially freshmen felt increased isolation due to not having peers to ask for advice since they could not meet and make friends with classmates after the move to online classes. Thus, one can see how the use of Zoom could directly combat these issues.

Most of the research into technology in relation to language study in Japan has focused primarily on the teacher's perceived usefulness of the technology rather than the viewpoint of students (Toland, White, Mills & Bolliger, 2014; Murakami, 2016). One study by Rentler and Apple (2020) showed that students felt positively about the use of LMSs to submit homework assignments and receive assessment and found the system beneficial in preparation for tests. However, there seems to be a lack of research regarding other benefits of LMSs, it's perceived ease of use by students and more detailed qualitative data regarding their opinions about it. Therefore, this study will attempt to examine the student's perceptions of LMS and other technology such as Zoom during the 2020 school year whilst classes were conducted online.

Methodology

Participants

This study took place in the second (autumn) semester of the 2020 school year at a large, prestigious, private university in Japan. The institute is a co-educational facility offering many different disciplines among its undergraduate programs. It is included in the Japanese government's Top Global University project, allowing it to receive funding with the goal of promoting globalization and internationalizing Japanese higher education.

The participants of this study were 38 Japanese students from 4 different courses. 20 participants were taking an intensive integrated skills course, meeting for 90 minutes three times per week. The students were all first-year students aged 18–19 and had a TOEIC score between 530 and 570.
Nine participants were taking a content based elective course. This is an advanced level course, and the students must have a TOEIC level of 600 and above as a prerequisite for enrolling. The course had one 90-minute class scheduled once a week over the 14-week semester. The students were in their 1st – 4th year of university so between 19 and 23 years old.

5 participants were taking a reading focused elective class. This course meets twice a week for

90 minutes. The students were in their 1st–3rd year and between the ages of 18 and 22. There was no level requirement for this class, so their English level was mixed.

Finally, 4 participants were taking an elective class aimed at students who desire low-level English practice. The course meets once a week for 90 minutes. The students in the class were in their second year and thus between the ages of 19 and 20.

Instrumentation

In the final class of the courses, students were given an optional and anonymous questionnaire to complete relating to their experiences of online study during the semester. The research purpose was explained to them, and they were asked for consent. The questionnaire was given as a google form and asked a set of 15 questions to collect both quantitative and qualitative data regarding their experience of studying online and using different technology such as Zoom and Google Classroom.

Questionnaire Questions

1. How many of your classes were online in the spring semester 2020?
2. How many of your classes were online in the autumn semester 2020?
3. How easy did you find taking classes in the spring semester 2020?
4. How easy did you find taking classes in the autumn semester 2020?
5. How useful did you find Google Classroom as a tool for receiving instructions?
6. How useful did you find Google Classroom as a tool for receiving materials?
7. How useful did you find Google Classroom as a tool for submitting assignments?
8. How useful did you find Google Classroom as a tool for communicating with your teacher?
9. How useful did you find Zoom for taking part in group discussions?
10. What other online platforms, applications and technology did you use in your courses this academic year?
11. What online platforms, applications and technology had you used before April 2020?
12. What online platforms, applications or technology would you like to keep using even if your classes return to campus?
13. What positive experiences did you have involving taking classes online?
14. What negative experiences did you have involving taking classes online?
15. Which do you prefer (taking classes online, classes on campus, a mixture of both)?

The first two questions were asked to ascertain how much experience they had of studying online due to the pandemic. There were 3 possible answers to choose from: *some*, *most* and *all*. The third and fourth questions investigated whether they had become more used to studying online in the second semester and if it had become easier for them. The answers were given using a Likert scale from 1: very easy to 5: very difficult.

Questions 5-8 were about how useful they found google classroom as a tool for receiving instruction, receiving materials (e.g. worksheets, reading/listening texts, videos), submitting assignments and contacting their teacher. The answers were given using a Likert scale of 1: 'not useful at all' to 5: 'extremely useful'. The purpose was to gauge the functionality of this LMS.

Question 9 asked about how useful they found Zoom as a tool for taking part in group instructions, to assess its usability for interaction in place of discussion in the classroom. It used the

same Likert scale for usefulness. Question 10 asked the students to name any other forms of technology they had used during their online classes over the year and as a follow up Question 11 asked what if any technology they had experienced using before the COVID-19 outbreak. Question 12 then asked if they would like to keep using any online platforms, LMS, applications or other technology if their classes returned to regular on campus lessons. To gather more qualitative data about what students liked and disliked about studying online, especially related to technology, the students were then asked in Questions 13 and 14 what positive and negative experiences they had of taking classes online and the final question, 15 asked which they preferred taking classes online, taking regular classes in a classroom or a mixture of both.

Results

Figure 1

How many of the courses taken by the students were online in the first semester 2020?

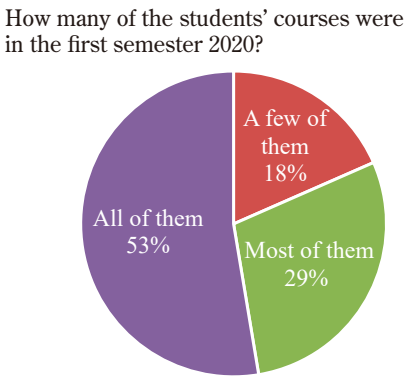
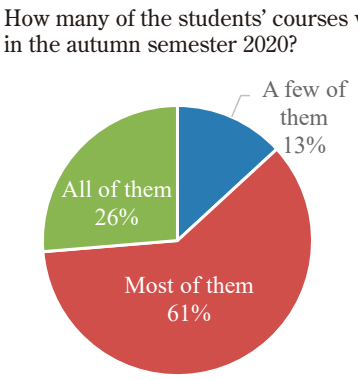


Figure 2

How many of the courses taken by the students were online in the second semester 2020?



Figures 1 and 2 show that the percentage of students taking all their classes online seemed to decrease between the first and second semester. However, it is clear to see in Figure 2 that most of the students' classes were still online.

Figure 3

How easy did the students find taking classes online in the first semester 2020?

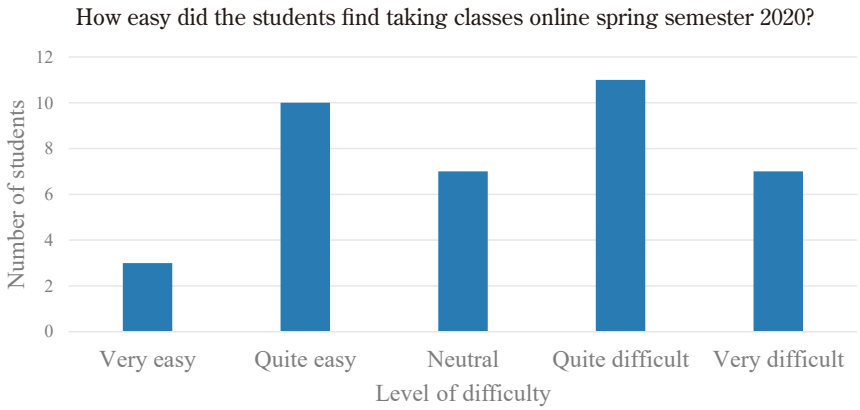
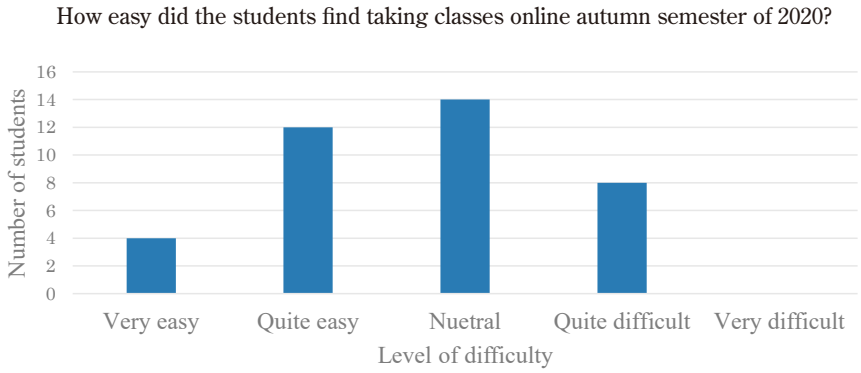


Figure 4

How easy did the students find taking classes online in the second semester 2020



Figures 3 and 4 show that students found online study far easier during the second semester with Figure 3 showing 7 students found it very difficult in the first semester and Figure 4 showing zero students found it very difficult in the second semester. The number of students who found it quite difficult was reduced from 11 to 8 and the number who found it very easy or quite easy increased. However, a significant number of 14 students remained neutral and said they neither found it easy nor difficult.

Figure 5

How useful did the students find Google Classroom as a tool for receiving instructions?

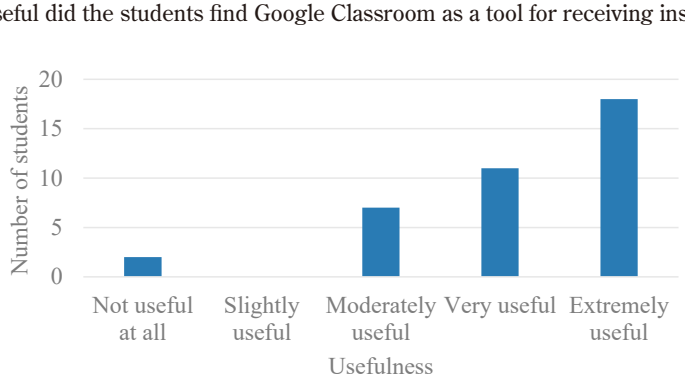


Figure 5 shows that the majority of students perceived Google Classroom as a useful tool for receiving instructions–18 students said they found it extremely useful, 11 said it was very useful, 7 moderately useful and only 2 said it was not useful at all.

Figure 6

How useful did the students find Google Classroom as a tool for receiving materials?

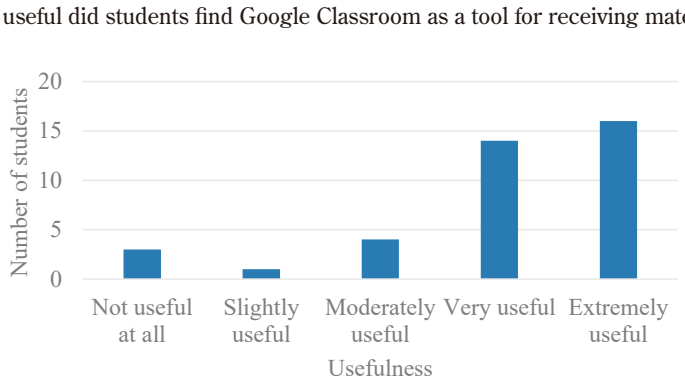


Figure 6 indicates that most students found Google Classroom a useful tool for receiving materials–16 students said extremely Useful,14 said very useful and 4 said moderately useful. However, one student said it was slightly useful and three said it was not useful at all.

Figure 7

How useful did the students find Google Classroom as a tool for submitting assignments?

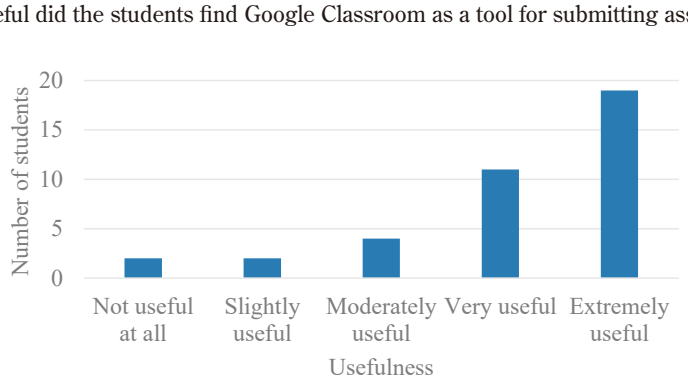
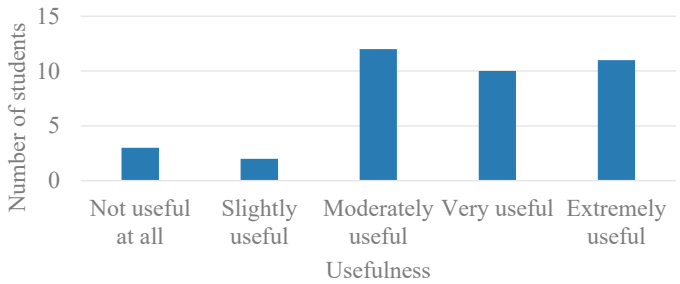


Figure 7 shows that Google Classroom was considered extremely useful by 19 students, very useful by 11 and moderately useful by 4 for submitting assignments.

Figure 8

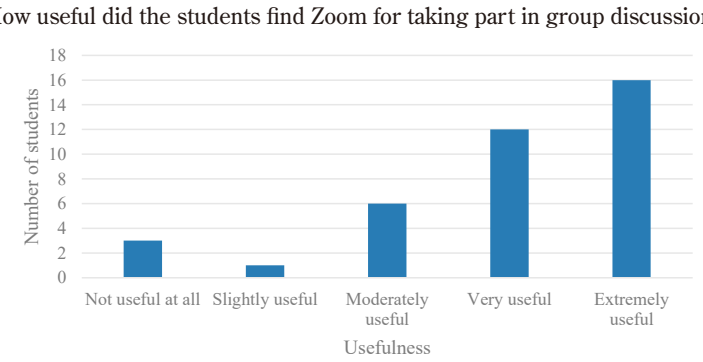
How useful did the students find Google Classroom as a tool for communicating with their teacher?



The graph in Figure 8 shows that the majority of students found Google Classroom a useful tool for communicating with the teacher–11 students said it was extremely useful, 10 said it was very useful and 12 moderately useful, with only 2 students saying it was slightly useful and 3 students saying it was not useful at all.

Figure 9

How useful did the students find Zoom as a tool for taking part in group discussions?



The results in Figure 9 present the case that Zoom was very useful as a tool to create synchronous interaction among students when they could not convene together–16 regarded it as extremely useful, 12 said very useful, 6 moderately useful, only 1 said slightly useful and 2 not useful at all.

Figure 10

What other online platforms, applications and technology did the students use in their courses over the 2020 academic year?

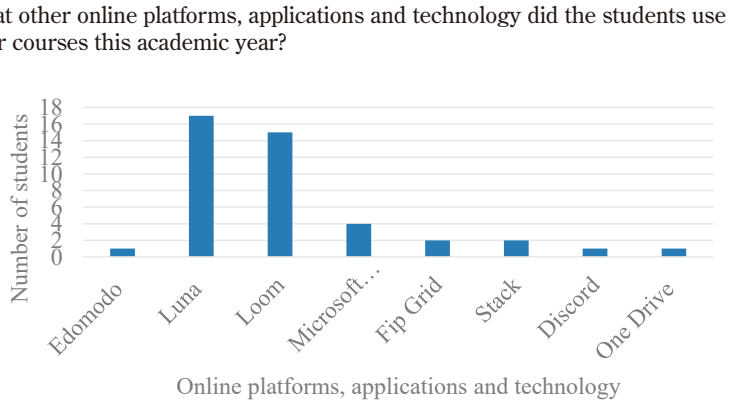


Figure 10 presents that by far, the two most popular other types of technology used by students were Luna, used by 17 students and Loom, used by 15.

Figure 11

What online platforms, applications and technology had the students used before April 2020?

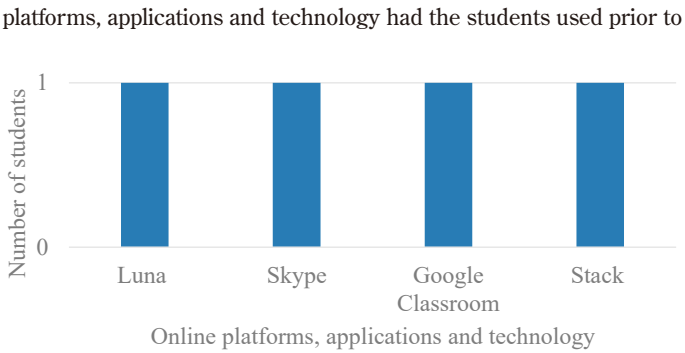
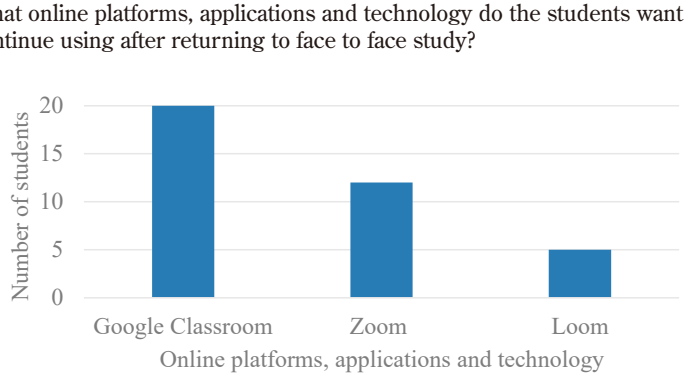


Figure 11 conveys that only 4 of the 38 students had used any of this technology prior to the 2020 academic year–1 student each had used Luna, Skype, Google Classroom and Stack respectively.

Figure 12

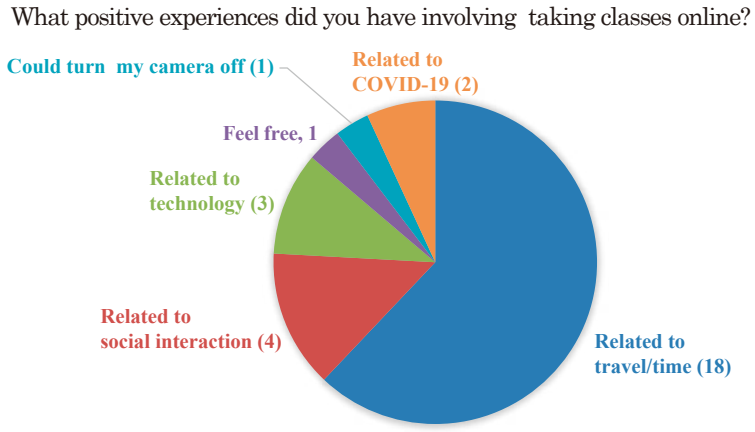
What online platforms, applications or technology would you like to continue using after we return to regular on campus lessons?



Twenty students (51%) stated they wished to continue using the LMS Google Classroom displaying a clearly positive view of its usefulness as a tool to assist their learning (Figure 12). A considerable proportion of the students, 12 (31%) stated that they wished to continue using Zoom even after the return to face to face classes. Loom was the third most popular application with 5 students (13%) advocating for its continued use after the return to regular classroom-based lessons.

Figure 13

The positive experiences students had related to online study



The answers to Question 13 regarding the students' positive experiences from studying online were quite varied, but the graph above has grouped together some of the answers that shared an overall topic or theme. The most common answers were related to time or travel with 18 answers. Some examples include, "I didn't have to wake up early; My house is far from the university" and "I had more time to prepare." Another student said, "I used the commute time to study." One of the students talked about being able to return to their hometown without missing classes.

The second most popular theme was related to social interaction with four answers in this group. Answers were related to being able to talk with classmates and "making friends". One student said that this course had given them "more opportunity for discussion" than her courses in the previous semester. The third most popular group of answers related to technology. One student stated a positive experience was "gaining the knowledge of technology". Another talked especially about giving "online presentations" and finally one stated that through "watching presentations recorded on Loom again and again, it was easier to be objective and find my development by myself". This clearly shows the student found this particular technology useful for self-study and improvement.

Two answers related to COVID-19 and being able to avoid the virus or crowded trains. Two answers were quite miscellaneous and difficult to fully comprehend without being able to ask the students for clarification. One said simply, "I could take the class to feel free", possibly this was related to the social interaction relieving them from isolation or possibly related to freedom of more time. Finally, one student stated, "I can do my camera off". Perhaps, meaning they felt more confident when speaking anonymously although the teacher did tell them to try to keep their cameras on to help assist communication and social connection.

Figure 14

The negative experiences students had related to online study

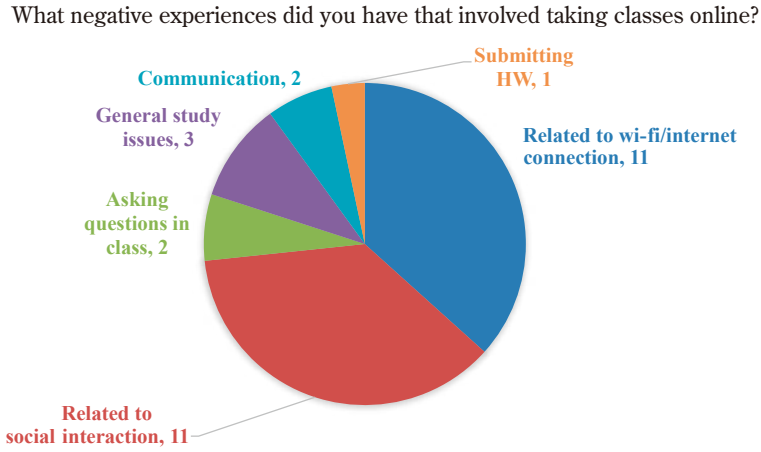


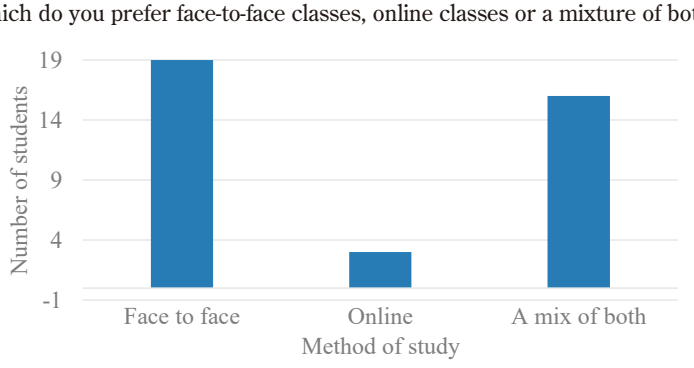
Figure 14 shows the negative experiences students had when studying online. Once more they have been grouped based on a shared theme or topic. The two most common themes were wi-fi/internet connection and issues related to social interaction with 11 answers in each. The answers related to connection issues were that students either had problems with their own connection or wi-fi or that their classmates did, causing a breakdown in communication. One student also complained about having to "borrow a wi-fi router from the university".

Equally common were issues with social interaction. Some answers were related to being unable to "meet friends" or "students" and it being "harder to get along with friends". This difficulty in interacting online was mirrored in other answers like "discussing projects online" being "inconvenient" and "Discussion online becoming silent because no one speaks". Others talked about feeling "alone" or missing "face-to-face" and the "precious conversation with teachers or friends" that happen in classroom lectures.

Besides these two main issues, there were three other answers. Three students talked about general study issues including forgetting classes, missing assignments and difficulty in concentrating. Two answers stated they found it difficult to contact the teacher or class. Finally, one student had "problems submitting homework"

Figure 15

Which medium for taking lessons do the students prefer: face to face, online or a mixture of both?



Although the results are quite close, Figure 13 shows that the majority of students would choose face to face classes as their preferred method of study. This option was selected by 19 (49%) participants. The next most popular was a combination of online and face to face study chosen by 16 students (41%). Finally, only three students (8%) of the participants preferred online classes.

Figure 16

Reliability statistics of questions 5-8 regarding usefulness of Google Classroom

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.886	4

Since questions 5–8 were regarding the same theme and the possible answers were the same, Chronbach's Alpha was used to measure internal consistency and the result was 0.886 (Figure 15). The result showed good internal consistency for this set of questions.

Discussion

Regarding the increase in face-to-face classes in the second semester seen in Figures 1 and 2, due to a reduction in the number of COVID cases, the university gave the option to more teachers (including language teachers) to offer some courses face to face at the beginning of the second semester. The teacher of the classes used for this study chose not to teach those courses face to face due to the difficulty of having to teach a mix of hybrid classes on campus and other classes online. Some other faculties were holding classes face to face on campus in the first semester with 18% saying they only had a few classes online and 29% saying most of their classes were online. Given that this university offers undergraduate degrees in disciplines such as science, it is likely that these classes required some practical elements. Since the university relaxed the rules allowing teachers to teach more of certain courses face-to-face in the second semester this explains why the number of students taking face to face courses increases.

Figures 3 and 4 suggest that most students will adapt to and become comfortable with online study, as they found it much easier after one semester. However, this is not the case for all students, and many were still not completely acclimatized to this way of study despite having taken online classes for the full academic year.

Figure 5 is evidence that Google Classroom can be an effective means for giving instructions to students. Google Classroom offers an efficient, instant and easily accessible method of sharing instructions with a whole class of students in a clear and permanent way. If we consider the teacher giving instructions in class or even writing them on the board, students may mishear the teachers or miss read the teacher's handwriting or students may be out of the room or absent and the instructions may be miscommunicated later by classmates. This is far less likely with Google Classroom. Looking at Figure 14 possible reasons for the two outliers could be their difficulty in or reluctance towards using technology or perhaps their limited access to computers at home or a strong internet connection.

Figure 6 conveys that the students found Google Classroom very useful as a tool for receiving materials. During the pandemic the use of LMS such as Google Classroom was an easy way to instantly share the materials with a whole class of students in a secure and practical manner. Teachers also had the ability to attach the materials to classwork or homework assignments to make instructions clear for the students, and most students could access them with comfort and ease. Regarding the negative responses, it's possible these four students may have had connection, computer access or technology issues, despite the teacher explaining and sharing guides on how to access materials using Google Classroom. Students were also told to ask classmates for help with any technological issues they were facing. The instructor did his best to address issues students faced. Another reason for their response might be that they prefer receiving paper worksheets and disliked reading from a screen. Consequently, one environmental benefit of the COVID pandemic and the shift to online classes has been the reduction in the use of paper used in the education sector around the globe.

Figure 7 presents Google Classroom as an efficient and popular method for students to submit their assignments. The assignments section on Google Classroom allows the teacher to set up clear instructions, share any necessary materials and set a deadline, which students can clearly see. This makes it far more difficult for a student to forget their assignments or miss deadlines. Submission is extremely simple; with the click of a button, they can then choose to type directly into a Google Document or upload any work from files on their computer such as a Word or PowerPoint file or even an audio or video file. Clear instructions were given in the form of Loom videos, which showed an instructor explaining the process using screen shots and this was uploaded to Google Classroom in the first week. At least one student clearly had technical issues or connection issues causing them to have difficulty to submit as shown in Figure 14.

Most students found Google Classroom a very useful system for communicating with their teacher (figure 8). In Google Classroom, students can very easily comment or ask questions on an assignment and Google Classroom will then email the teacher to notify them so that they can reply. The teacher can make their comments visible to one student or the whole class so answers that may be applicable to the questions of others can be made visible to everyone. In opposition, a small number did have issues as also seen in Figure 14, and the reasons may be similar to those already given for other issues above.

Zoom can be a means for group discussions and interactions (Figure 9). However, Zoom, or other teleconference applications can never replace the interaction that takes place face-to-face in a classroom and there are certainly several limitations. One obvious limitation of Zoom is that the teacher cannot monitor the class as easily when they are all in the same main room, and when put into break-out rooms, the teacher can only monitor one room at a time so they cannot see or hear what the other students are doing. It is also far more difficult to gauge other people's facial expressions, body-language and tone of voice and miscommunication is far more common when using Zoom as opposed to face-to-face communication. In addition, technical issues such as students' cameras or microphones not working, or their connection failing can severely stunt or halt an interaction. However, during the pandemic when face-to-face interaction was impossible, applications like Zoom offered the best tool to afford some synchronous interaction and it seems most students would agree and found them to be very useful and usable.

Figure 10 shows a diverse selection of other examples of technology used to assist online study. Luna is this institution's LMS. However, the instructor of these classes found Google Classroom to have a more easy-to-use interface and chose it instead. Loom is a video messaging tool that allows

users to share their screen whilst simultaneously sharing a video recording of themselves using the computer's camera. It can be very useful for recording instructional videos of how to perform actions such as submitting work using Google Classroom, and the teacher of this class used it for this purpose. It can also be useful as a tool for students to record a presentation and show their slides in Power Point or Google Slides whilst also showing their face, adding a more personal feeling to the presentation. The instructor also used Loom for this purpose at times during some of the courses.

The data in Figure 11 concretely presents the fact that almost no students had any prior experience of using the technology discussed in this study before the 2020 academic year.

The data presented in figure 12 indicates a strong desire among a majority of students to continue using the LMS Google Classroom even after returning to face to face study. A substantial 31% stated they wished to continue using Zoom, which draws further questions about how they would like its use implemented. The desire of 13% to continue using Loom is surprising; one might expect students would prefer to give presentations in person in the classroom, but this result suggests some would prefer to pre-record them at home using a computer. As one student mentioned in question 14, she found it instrumental in allowing her to self-analyze and improve her English, so perhaps this means of recording their own presentations is a useful and implementable strategy for improvement.

Figure 13 shows many interesting findings of the study. It seems a popular benefit of this distance style of learning is the convenience of not having to travel to the university campus and the extra time that this saves students. Other results indicate that many students were pleased that despite being forced to stay at home they could still interact with classmates using applications like Zoom. Three specific answers here strengthen the previously discussed data in showing that platforms such as Google Classroom, Zoom and Loom can be very useful tools for language study students and online study or the use of these kind of applications is beneficial for assisting the students in learning useful technological skills as well as helping their language acquisition.

Even in a technologically and economically advanced country such as Japan all university students do not have access to a computer at home with a stable wi-fi connection (figure 14).

The prevalence of answers relating to issues with social interaction or the lack of it in Figure 14 conveys that online study cannot fill the void left by lack of real-world contact and although Zoom can be used to create synchronous group discussion and interaction, there are still issues and problems that mean it cannot equate to classroom interaction. Regarding the other general issues mentioned in figure 14, it seems difficult to see how these problems connect specifically to online study but perhaps the students felt they would not have had these issues had classes been face-to-face. The same seems true for the issues with contacting the teacher and submitting homework.

Figure 15 clearly shows that the majority of students would prefer to take classes face to face. This is understandable as they have enrolled in face-to-face classes and are likely attending university not only to learn but also for social experiences such as joining clubs and making new friends. Also, with regards to a communicative skill such as language the benefits of face-to-face study in terms of opportunities for receiving varied input, testing output and receiving corrective feedback are clearly greater than the opportunities when taking part in online study, suggesting face to face would be superior in terms of facilitating language acquisition. This being said, a large number (16 students) would prefer a mixture of face-to-face classes and online and 3 would prefer completely online. It seems to be that having studied for one academic year online many students have adapted to this style and can see the benefits especially in terms of time and convenience of not having to travel.

Conclusion

In response to research question 1, the LMS Google Classroom was clearly the most effective technological application utilized during the online teaching situation. Second, Zoom was also very popular as video conferencing software, allowing interaction between the students and teachers in real time. Finally, Loom was a popular application allowing students to record presentations showing their face and slides simultaneously. The popularity of these mediums is shown by the results of the student questionnaire and the positive opinions about them are shared by the teacher.

Regarding the second research question, data obtained in the student survey may point towards possible pedagogical implications about how to implement and utilize this technology to benefit students and support their learning. The data supports the use of LMSs such as Google Classroom, as a means of giving clear instructions to students, as well as an efficient way of sharing materials with them. The current fear of COVID-19 and other current diseases and viruses means any method of reducing contact such as circulating worksheets helps reduce the risk of transmission. Continued reduction in the paper trail as a trend in the future could also lead to a reduction in deforestation that would be environmentally beneficial for the planet. Google Classroom is also an excellent tool for communication between students and teachers and a straightforward method for students to submit their assignments.

The researcher and writer of this paper has continued to use Google Classroom as his preferred LMS while teaching at Rikkyo University in the 2021 spring and autumn semesters, for classes including Discussion, Reading and Writing, English Communication, Debate and Presentation. Whether classes have been online or face-to-face, it has been a valuable tool for communicating with students, sharing materials, setting and collecting assignments.

Zoom has also been used effectively by the researcher at Rikkyo in 2021 to conduct synchronous classes when the COVID-19 situation again made it impossible to teach face to face. Zoom can be used to create group discussions and interaction, especially in situations like a pandemic when meeting face to face is impossible. However, video conferencing software such as Zoom is far from being able to replace the social interaction that takes place in the classroom and face to face interaction should always be the first choice wherever possible. Other technology that can assist learning might be presentation recording software such as Loom to help students analyze their own speech. Further research into how technology can assist language study and be utilized by both teachers and students, through the COVID-19 crisis and beyond, would be hugely valuable to our field.

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