

RECORDED LECTURES IN MULTI-CAMPUS EDUCATION: A CROSS-CASE ANALYSIS

Abdullah Bahmani and Rune Hjelsvold, NTNU and Excited¹

These days, universities all over the world offer lecture capturing to provide recorded lectures as a supplement tool for their on-campus students or as a substitute for live lectures for distant students. In this study, through quantitative research and by undertaking the uses and gratification theory, we examine students' perceptions about recorded lectures in the context of two multi-campus courses offered in the Norwegian University of Science and Technology in the Fall semester 2018. Data for this research was collected by using an online questionnaire sent to students through the Learning Management System (LMS). Our results show that students mainly used recorded lectures to make up for missed classes, for understand the live lectures better and for reviewing the course content before the exam. Students' use of recorded lectures seems to vary - in terms of amount, time and reason for watching - based on the course content and their location. Also, the results show that the course setting can influence the way students use recorded lectures. We conclude that recorded lectures are useful for both main and remote campus students and that watching recorded lectures can decrease their level of anxiety about the course and exam.

KEYWORDS: Multi-Campus Education, Multi-Campus Courses, Recorded Lectures, Cross-Case Analysis

1 INTRODUCTION

In recent years, there has been an increasing interest in the use of recorded lectures in higher education (Bos, Groeneveld et al. 2016). As a result, to date, many universities in different countries (such as Australia, the US, Canada, and across Europe) have provided lecture capturing system at the institution level (Morris, Swinnerton et al. 2019). Therefore, students have benefited from recorded lectures as a means for their learning and backing their education (Bos, Groeneveld et al. 2016). There are several studies addressing the impact of recorded lectures on academic staff and students (Evans 2008, Al Nashash and Gunn 2013, Morris, Swinnerton et al. 2019). According to Morris, Swinnerton et al. (2019) the reasons why the usage of recorded lectures is increasing are: (i) it can be added to ordinary lecturing, the prevailing teaching method without the need for major changes (ii) almost invisible devices in the classroom and little or no need for technical training. (iii) students' positive feedback on recorded lectures. Despite the number of studies on lecture capturing in higher education, multi-campus education literature lacks in discussing how recorded lectures are being used by students on different campuses of a multi-campus course.

Since the merger in 2016², the Norwegian University of Science and Technology (NTNU), as a multi-campus university, has started to offer multi-campus courses to gain synergy and to benefit from collaboration among campuses. Video-streaming and video-conferencing are two primary technologies used for multi-campus courses. These technologies can be used to capture video and audio from one campus, and then distribute to other campuses in a live or near to live manner. This study puts the focus on the basis of using recorded lectures to examine reasons why students use recorded lectures and to study potential differences between groups of students. This study also aims at finding how course settings may impact the way in which students use these videos at NTNU. Therefore, the research questions that we try to answer in this research are as follow:

¹ the Centre for Excellent IT Education

² <https://www.ntnu.no/fusjon>

Considering students in two different multi-campus courses and different locations:

- RQ #1: Why do the students in main and remote campuses use recorded lectures?
- RQ #2: What, if any, are the differences between students in their use of recorded lectures?
- RQ #3: What is the influence of course setting on the use of recorded lectures by students?

The significance of this study is twofold: Firstly, it establishes the basis for research on the use of recorded lectures in multi-campus education. Secondly, it provides some indications of differences in the recorded lectures usage by students in different courses and campuses.

2 RELATED WORK

2.1 Recorded lectures in higher education

Lecture recording in various terms (“lecture capture, lecture podcasting”) had been under the investigation by the researchers for almost twenty years (Gysbers, Johnston et al. 2011). It indicates the process of recording the content of the lecture (audio and video) to archive it for later use. Lecture recording needs some hardware and software devices to synchronize the recorded audio with the video. Recorded lectures are a unidirectional medium for communication, which is used for transporting the content of the lectures (Woo, Gosper et al. 2008). According to the study of Nordmann and McGeorge (2018), there are three-way of lecture capturing: opt-in, opt-out, and customized approach based on the institutional policies, which, for example, specify the recorded lectures either as a supplement tool for learning or a substitution for live lectures. Recorded lectures as a supplementary tool to students includes the face-to-face lectures which is available right after the lectures (Bos, Groeneveld et al. 2016).

The literature on recorded lectures highlights several impacts. Evans (2008) pointed out that recorded lectures give students flexibility. Bassili (2008) claimed that it helps students to have a different type of learning style. According to Davis, Connolly et al. (2009), “*lecture capture has the potential to alter how face-to-face teaching is delivered and received*”. Traphagan, Kucsera et al. (2010) reported the higher final grade in their study when the recorded lectures were available for the students. It is also shown that students can benefit from recorded lectures during the exam time to prepare themselves by repeating and revising (Cramer, Collins et al. 2007, Van den Bossche, Verliefdede et al. 2012). By providing recorded lectures for students, they can use stored lectures at any time and place they want (Al Nashash and Gunn 2013).

Yet, some researchers concerned about the recorded lectures. Griffin, Mitchell et al. (2009) and Gysbers, Johnston et al. (2011) argued the possibility of misusing the recorded lecture by students and procrastination. Some researchers reported that the availability of the recorded lectures causes lower attendance at the live lectures (Traphagan, Kucsera et al. 2010, Gupta and Saks 2013), and the correlation between absenteeism and lower grade already proven (Devadoss and Foltz 1996, Stanca 2006).

2.2 Multi-campus Education and recorded lectures

To solve the challenge of the quality assurance in multi-campus universities, multi-campus education as a flexible mode of teaching-learning is offered by universities (Ebden 2010). This new type of education provides collaboration among campuses to share their resources instead of having a hard copy of them. In the literature on multi-campus education, video-conferencing and video-streaming are two main technologies for providing synergy among campuses (Freeman 1998, Woo, Gosper et al. 2008, Szeto 2014, Hjelsvold and Bahmani 2019).

According to Woo, Gosper et al. (2008), recorded lectures is one of the technologies which can eliminate the difference between students from different campuses who took a multi-campus course. Using recorded lectures by students either on the main campus or distances campus reflected a very positive experience (Jesshope 2000). As Woo, Gosper et al. (2008) pointed out, recorded lectures are used to help

students in the distance to supplement their paper-based learning resources. At the same time, on-campus students could use them to make up a missed class or match the course content with lectures.

3 THE STUDY

3.1 Theoretical Framework

In this study, we adapt to the Use and Gratification Theory (UGT) (Katz, Blumler et al. 1973). This theory is considered as a "psychological communication perspective," which tries to examine how people use media to eliminate their needs (Rubin 2009). UGT is different from other theories related to media consumption as it gives individuals the power to anticipate what media they use, with having this assumption that it is clear for them their intent and use (Gusfield 1994). As stated by Urista, Dong et al. (2009), this theory suggests that individual media consumers are active. According to (Katz, Blumler et al. 1973), there are five components of this theory:

1. *"The audience is conceived as active."*
2. *"In the mass communication process, many initiatives in linking gratification and media choice lies with the audience member."*
3. *"The media compete with other sources of satisfaction."*
4. *"Methodologically speaking, many of the goals of mass media use can be derived from data supplied by individual audience members themselves."*
5. *"Value judgments about the cultural significance of mass communication should be suspended while audience orientations are explored on their own terms."*

Therefore, according to McQuail (1987), an individual's aim of using media is as follow:

1. *"To be informed or educated."*
2. *"Identify with characters of the situation in the media environment."*
3. *"Simple entertainment."*
4. *"Enhance social interaction."*
5. *"Escape from the stresses of daily life."*

3.2 Research Approach

This research was conducted in the context of the Norwegian University of Science and Technology (NTNU). In 2016, the Norwegian University of Science and Technology (NTNU) was merged with three state colleges dispersed in different geographical places in Trondheim, Gjøvik, and Ålesund. Therefore, NTNU, at the moment known as a multi-campus university. In the context of the multi-campus university, sometimes resources are unevenly distributed. So, one of the main challenges of the multi-campus university, as Groenwald (2018) pointed out, is the quality assurance, which means providing courses and study programs with the same learning quality to students on different campuses. To provide synergy, collaboration, distribute resources evenly among campus, so far, there has been some initiative to repurpose current, traditional, and single campus courses to multi-campus courses at NTNU (Hjelsvold and Bahmani 2019). In this study, through quantitative research and with a case study strategy, we try to respond to the research questions.

3.3 Case Setting

In the Fall semester of 2018, two elective courses, one for bachelor students (course A) and one for master students (course B), were targeted for a multi-campus delivery. The main reason for this decision was that, in both cases, some students at a remote campus wanted to take these courses, but there was no academic staff to offer the courses locally. In course A, the course description in the main and remote campuses was the same in terms of the number of credit and learning outcomes. However, in course B, course credits and descriptions were not the same but similar. To cover the differences between the main

and remote campus of the course B, a teaching assistant (TA), who was a Ph.D. student, was hired to lead some additional class activities.

Both courses were lecture-based. The instructors used a computer for presenting PowerPoint slides and relevant video pieces. Lectures were delivered in two main auditoriums on the main campus. The auditoriums were already equipped with a permanent desktop computer, a video-streaming tool (Mediasite³). Lecture room for course A was equipped several semesters ago while the equipment in the lecture room for course B had been installed just before the semester. Mediasite provided a near to live lecture streaming with a 30-second delay. The way Mediasite works is capturing the audio and video from one place, buffering and storing them on the local cloud system. At the remote location, students can watch the lectures streamed from the main campus by following the hyperlink provided by the system. This characteristic of Mediasite enabled NTNU to keep the lecture recordings on its cloud system for a period such that students could access them later, too. The motivation for having recorded lectures was to enable students on both campuses to watch the recorded version even if they could not attend the live lectures. The instructor of the course A requested to keep the recorded lecture until the end of the semester, while in the case of course B, the teacher decided to have the video of each lecture deleted after 24 hours.

3.4 Data Collection

For this research, in December 2018, students from both courses on both campuses were invited to participate in an online questionnaire, which was done by the internal survey system of NTNU. The questions asked were the same for both groups of participants. In total, the students were asked seven multi-choice questions. The questions are shown in Table 1. Table 2 summarizes the information related to the participants in the two cases.

Table 1. The list of questions students answered

No	Question	Answers
1	Which one did you use?	Live lectures, Recorded Lectures, Both
2	How much percent have you watched the recorded lectures?	100%, 75%, 50%, 25%, Nothing
3	When did you watch the recorded lectures?	The same day after the class, I save a copy and watch it later, I save a copy and watch it during the exams, NOT applicable
4	Why did you watch the recorded lectures?	To make up a missed class, To review course content before the exam, To understand lecture content better, To add more information to my notes, I cannot attend the course that time, NOT Applicable
5	Watching a recorded lecture reduces my anxiety about the course and exam	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
6	Level of satisfaction about the quality of recorded lectures?	Very Satisfied, Satisfied, Neutral, Dissatisfied, Very Dissatisfied
7	How much do you think watching the recorded lectures is useful for you?	Very Useful, Useful, Neutral, Useless, Very Useless

Table 2 summarizes the information related to the participant in both cases:

³ <https://mediasite.com/>

Table 2. The number of participants in each course and campus

Course	Campus	Participants	Total
Course A	Main Campus	27	33
	Remote Campus	6	
Course B	Main Campus	25	36
	Remote Campus	11	

4 RESULTS

4.1 Approach to the Cross-case Analysis

According to Agresti and Kateri (2011), “a categorical variable has a measurement scale consisting of a set of categories.” Therefore, a set of data that comes from using a categorical variable is categorical data. As the questions we asked students in our study are categorical variables, our data is categorical. To analyze our categorical data and compare the students’ answers to the questions in different parts of the test, first, we tried the Chi-square test. If the data did not meet the necessary conditions for a Chi-square test, as explained in (McHugh 2013), we selected Fisher’s exact test. The hypothesis tests are done based on the student responses in:

- Course A vs. Course B
- Main-Campus of Course A vs. Remote-Campus of Course A
- Main-Campus of Course B vs. Remote-Campus of Course B
- Main-Campus of Course A vs. Main-Campus of Course B
- Remote-Campus of Course A vs. Remote-Campus of Course

In our statistical analysis of student responses, the null hypothesis is that the two cases are similar, and the alternative hypothesis that the two cases are dissimilar. When comparing two actual groups of students, our hypothesizes are:

- H_0 (null hypothesis): student responses to the questions are similar in both groups.
- H_a (alternative hypothesis): student responses to the questions in one group are significantly different from the student responses in the other group.

4.2 Detailed Results

Question No.1 was about how the students in different courses and campuses used live lectures and recorded ones. There is no significant difference, neither in course A nor in course B, in the use of live and recorded lectures, as shown in Figure 1. In both cases, students were almost equally split over the three alternative uses of live and recorded lectures.

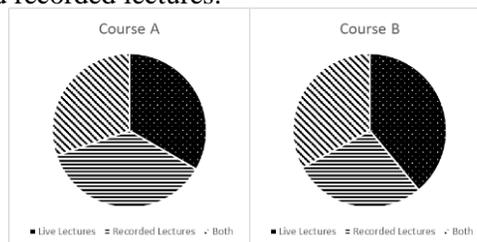


Figure 1. Student’s classification based on using live and recorded lectures in the course A and B

Students on two campuses of the course A indicated that they were using the live and recorded lecture differently, and this difference was statistically significant (Test= Fisher’s Exact Test, Confidence Level= 95%), as shown in Figure 2. While students in the main campus of the course A formed three almost

equally sized groups, students in the remote campus mainly used the recorded lecture (83%); none of the remote campus students used both live and recorded lectures.

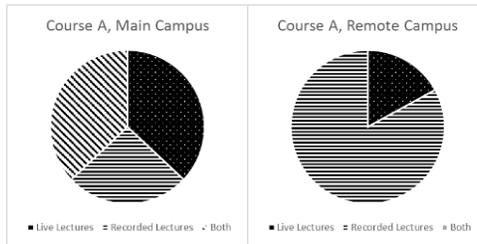


Figure 2. Student's classification based on using live and recorded lectures in the main and remote campus of course A.

Also, there was a statistically significant difference between remote students in the two cases (Test= Fisher's Exact Test, Confidence Level= 99%), as shown in Figure 3. Considering remote campuses, students in course B mostly used a combination of live and recorded lectures (55%), but the majority of students in course A watched the videos (83%), and none of them used both live and recorded lectures. Other hypothesis tests for the answers of question No.1 did not reveal any significant differences.

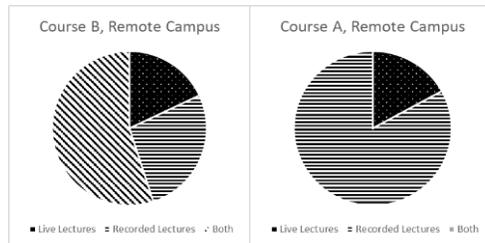


Figure 3. Student's classification based on using live and recorded lectures on the remote campus of the course A and B.

Question No.2 examined the percentage of recorded lectures that were watched by students. Figure 4 summarizes student responses in different courses and campuses:

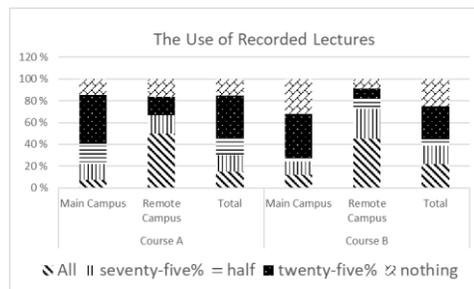


Figure 4. The percentage of recorded lectures by students in the two campuses of the two courses

Hypothesis tests for this question show that students on different campuses of the course A and B were using a different amount of the recorded lectures, and these differences were statistically significant (Test= Fisher's Exact Test, Confidence Level= 90%, and 95% respectively). In course A, just 7% of students in the main campus watched all the recorded lectures, whereas half of the remote campus students watched the recorded lectures completely. In the same course, 44% of students in the main campus used one-fourth of the videos in comparison with 17% of remote campus students who did the same. Also, there is a statistically significant difference between the remote campus students in course A

and B (Test=Fisher’s Exact Test, Confidence Level=90%). 50% and 45% of students in remote campus in course A and B, respectively, watched all the recorded lectures, but the rest had different attitudes towards the recorded lectures. Other hypothesis tests for this question did not reveal any significant difference.

Question No.3 aimed to get an insight into when students watched the recorded lectures. Figure 5 shows a summary of the results.

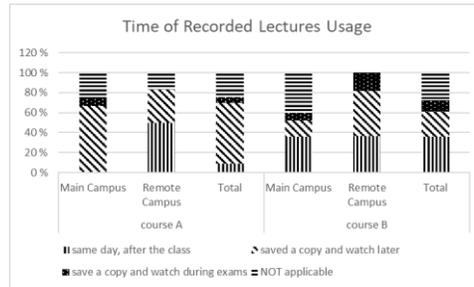


Figure 5. Time of recorded lectures usage by students in the two campuses of the two courses

Hypothesis tests show that there is a significant difference among students in courses A and B on the time when they watched recorded lectures (Test= Fisher’s Exact Test, Confidence Level= 99%). In course A, in total, most students saved a copy of the recorded lectures for later use while in course B, just one-fourth of them did the same. In course A in total, just 9% of students watched the recorded lectures on the same day as the live lectures, whereas, in course B, more than one-third of all the students used the recorded videos.

Considering both courses A and B, students in the main and remote campus had different preferences towards the time of watching recorded lectures (Test=Fisher’s Exact Test, Confidence Level= 99%, and 95% in turn). For example, in course A, 67% of main campus students saved a copy while half of the students in the remote campus watched the recording on the same day as the live lectures. In course B, while 36% of both main and remote campus students watched the videos the same day as the live lectures, 45% of remote students saved a copy of videos in comparison with just 16% of the students on the main campus who did the same. Another hypothesis test that revealed a statistically significant difference between the groups of the test is the one between students of the main campuses in both courses of A and B (Test=Fisher’s Exact Test, Confidence Level=99%). Considering the main campuses of both courses, while in the course A, most students (67%) specified that they had a copy of the lecture for the future use, just 16% of students in course B did the same, and one third of them watched at the same day as the live lectures. Statistical analysis revealed that there is no significant difference between students in the remote campuses in course A and B.

Question No.4 discussed the reasons why students used the recorded lectures. Hypothesis tests that compare student responses to this question in total shows that there is a significant difference between the two cohorts of students in course A and B (Test=Fisher’s Exact Test, Confidence Level=99%). Figure 6 summarizes the students’ response rate for possible answers. While students in course A mostly used recorded lectures to “make up the missed class” (27%) and because they “cannot [could not] attend the class” (33%), students in course B used the videos in order to “review content [of the course] before the exam”(31%) and understand the [live] lectures better”(19%).

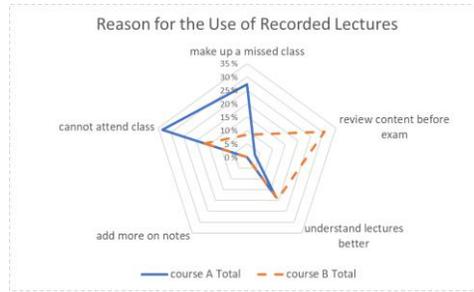


Figure 6. Reason for the use of recorded lectures by students in course A and B

Another hypothesis test that showed a statistically significant difference among students' responses was the fisher's exact test among two cohorts of remote campus students in both courses of A and B with a 99% confidence level, as shown in Figure 7. Considering remote campuses, 67% of student in course A used the recorded lectures because they "cannot [could not] attend the class" but 55% of students in course B did the same because they wanted to "review [the] content of the [live] lectures before the exam". The other hypothesis tests for this question do not reveal any significant differences between groups in the tests.

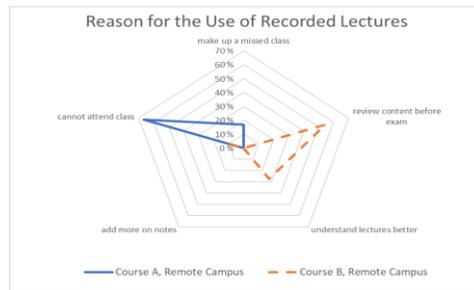


Figure 7. Reasons for the use of recorded lectures by students in remote campuses of the course A and B

Question No.5 examined the impact of recorded lectures on the students' stress about the course and exam. In general, more than half of students in course A and one-third of students in the course B was "Strongly Agree" and "Agree" that "watching recorded lecture reduces [their] anxiety about the course". Figure 8 summarizes student responses to this. None of our hypothesis tests showed a significant difference between the groups in the tests, which means that the impact of recorded lectures on the anxiety about the course and exam seems to be quite similar in the two courses and on the two campuses.

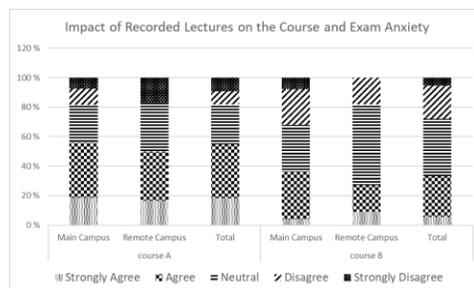


Figure 8. The impact of recorded lectures on the course and exam anxiety on students in the two courses

Question No.6 addresses the level of student satisfaction with the quality of the recorded lectures. While Figure 9 summarises the students' response to this question, our hypothesis tests showed that there are just significant differences between students in course A and B in total and students in remote campuses

of both courses by doing Fisher’s Exact Tests and having Confidence Levels of 95% for both tests. While most students in course A (63%) were at least satisfied with the quality of the recorded lectures, less than one-third of students (28%) of the course B had the same impression of the recorded videos. 17% of the students in course A were “dissatisfied” with the quality of the recorded lectures as compared to one-third of the students in course B. There was no significant difference in other hypothesis tests.

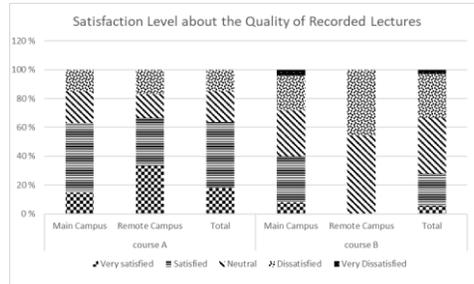


Figure 9. Level of students’ satisfaction about the quality recorded lectures in the two courses

Question No.7 examines the students’ assessment of recorded lecture usefulness. More than half of the students in either course agreed that recorded lectures were at least useful to them. The main campus students in course B, however, had a different impression than the remote campus in the same course. This difference was statistically significant (Test=Fisher’s Exact Test, Confidence Level=90%), as illustrated in Figure 10. Considering course B, 82% of the remote campus students agreed that the recorded lectures were “useful” and “very useful”, compared to 44% of students on the main campus. 24% of main campus students considered recorded lectures as “useless” or “very useless”, while in the remote campus, just 9% of students marked the recorded lectures as “very useless”, and none did as “useless”.

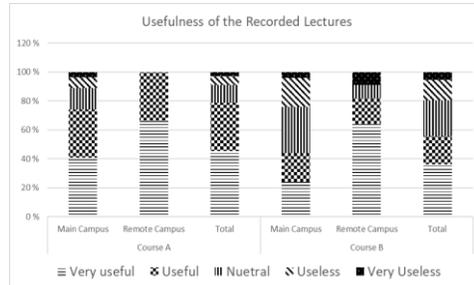


Figure 10. The usefulness of the recorded lectures in the two courses

5 DISCUSSION

Our findings show that students differ in whether they make use of live lectures, recorded lectures, or both. In both courses, students are distributed into three almost equally large groups. The statistical analysis showed that there is no significant difference between students in different courses. This means that regardless of the location and the course of study, students had the freedom to select recorded lectures as a supplement or substitute tool for the live lectures in their learning process. Regarding the first component of UGT (active audience), it can be pointed out that the students themselves chose to use recorded lectures. However, we found that students of a course at the main campus may have a different recorded lecture usage pattern compared to students at the remote. In course A, for instance, there was a significant difference between main and remote campus students regarding the use of live and recorded lectures. The main reason for this difference was the number of students in the remote campus who could not attend the live lectures on the remote campus, so they had the option to watch the recorded lecture. In

course B, however, there was no significant difference between students in the main and the remote campus.

The findings also reveal that there is a statistically significant difference between students in the remote campus of both courses. Considering remote campus in course A, most of the students tended to watch recorded lectures, whereas, in course B, students seemed to prefer a combination of live and recorded lectures. The course settings may cause this difference. As we mentioned in the case setting section, credit, and content of the course A was the same in both campuses, though, in course B, there were differences between the main and remote campuses in terms of credits and content. Remote campus students in course A could choose to attend the class or to watch the recorded lectures more freely as there were no differences in the learning process. However, as already mentioned, to cover the difference between the main and remote campus in course B, the TA did some in-class activities on the remote campus. Therefore, remote campus students in course B mostly decided to attend the live lectures to participate in the class activities.

Our study shows that students on the remote campus of both courses tended to watch more of the recorded lectures than students on the main campus. One possible explanation for this difference for course A is the fact that, generally, there is not much difference between viewing the received live lectures on the remote campus and watching the recorded lectures. So, they might decide to watch the videos at the time and place of their convenience instead of showing up in the class and watching the lecture on the big screen shared from another location. However, in course B, remote students used videos along with attending the class because of on-class activities. This is consistent with our previous study (Hjelsvold and Bahmani 2019) that there should be some on-class activities on each campus of a multi-campus course.

The teacher for the course A decided to store the recorded lectures on the university cloud system until the end of the semester. Therefore, students could watch them at any time of convenience or even save them for later. However, in course B, the teacher set a policy for the time of storing the videos for only 24 hours after the session. This difference in the policy made the students in course B mostly to watch the videos right after the live lectures. This customized policy in course B is the main reason for having a significant difference between course A and B. This is consistent with the work of Nordmann and McGeorge (2018).

Our findings show that students used recorded lectures alone or in combination with live lectures in both courses. The university just provided the opportunity of recording the lectures, and it was students who decided to use the recorded lectures. In other words, as it comes from UGT, students were active, and the recorded lectures were passive. Students, specifically those who missed live lectures, used the recorded lectures to be informed about the lectures and the course content. This is in line with the work of McQuail (1987), which in the first aim specified that individuals use media to be informed or educated. This also held for the students who used recorded lectures to review the course content and understand the lectures better.

We found that, in general, students in courses A and B had different reasons for why they used recorded lectures. Also, we found that this difference comes from the different preferences that remote students had in courses. Moreover, course settings seem to influence how students use recorded lectures. Considering remote campuses, most of the students in course A were watching recorded lectures because they wanted to make up the missed class or even, they could not attend the live lectures at the time of sessions. This was mainly because there was no difference between the live and recorded lectures. However, students in course B used them for reviewing the course content or understanding the lectures better as the course setting for them was different from the one for students on the main campus. They used the recorded lectures along with the class activities.

When it comes to assessing the impact of recorded lectures on the students' course and exam anxiety, there was no significant difference, although students in course A gave slightly more positive feedback

than students in the course B. The reason for this may be found in the difference in the course settings. In course A, the setting was the same for both main and remote campus students. By watching the recorded videos, students could reduce their anxiety, while for students in course B, specifically for students in remote campus, students had to do some class activity other than what the teacher asked them to do during the live lectures. So, they had to work more in course than students in course A. This is in agreement with the aim number five in the work of McQuail (1987), where the writer explained that individuals use media to “escape from the stresses of daily life.”

In either course, it is students who select to use recorded lectures for their communication with the teacher and the course content. This is similar to the second component of UGT. While in either course, nobody mentioned that they used recorded lectures to add more information on their class notes, the goal of using recorded lectures combined with the information that students could get from the course materials (UGT component no.3). This is also in line with the work of McQuail (1987).

In general, students in courses A and B indicated that they experienced the quality of the recorded lectures differently. The main reason for this difference probably is because of the technological aspects of the course. Lectures in course A were recorded in a lecture hall that was equipped with ICT devices some semesters ago, and the devices have used several times. Therefore, the number of possible issues that might cause technical failures during the lecture had been reduced, while in course B, the lecture room had been equipped just some days before the semester started, and there was no opportunity to test the technical setup entirely, and any technical failure could happen. Therefore, the recorded lectures in course B affected by this failure and reduced their quality.

The majority of the students considered the recorded lectures being useful. However, students on the main campus of course B had different opinions on the usefulness than students in the remote campus. The majority of remote campus students found the recorded lectures to be useful, while students on the main campus found them less useful. The reason may be that remote students could combine the recorded lecture with the class activities to review the content and understand the lecture better while the recorded lectures available to the students on the main campus were the same as the live lectures.

5.1 Implication for Theory

The contribution of this study is an account that is given to the UGT. This theory is used in different settings except in multi-campus settings for the recorded lectures. UGT helped us to analyze our data and explain the findings.

5.2 Implication for Practice

The findings of this study are beneficial for the multi-campus universities to store the lectures which are shared from one campus to another. This is useful for both main and remote campus students to either make up the missed class or review the course content.

5.3 Limitations of the research

This research has limitations in terms of scale (lectures were shared between two campuses) and the size of participants who completed the questionnaire. Also, in this research, we used video-streaming tools for lecture sharing, and the results are constrained by this equipment's limitations.

6 CONCLUSION

This paper aims to study the use of recorded lectures in two multi-campus courses and to examine the possible differences between the different campuses and groups of students and to assess the potential impact of different course settings. In this study, we learned that recorded lectures are beneficial for both

main and remote campus students, though their use of recorded lectures may differ in purpose and amount. Recorded lectures may help students to make up missed classes, understand the live lectures better, and review the course content before the exam. Also, recorded lectures can help to reduce the students' course and exam anxiety.

This study showed that students' use of recorded lectures could vary in terms of amount, time and reason, depending on the course and location. The study also shows that the course setting can influence the use of recorded lectures. In this study, we also learned that any policy on the recorded lectures might impact the student's style of using recorded lectures. Setting a time limit for using the video, for instance, may limit the students' access to use the lecture recording when preparing for the exam. As in the context of multi-campus education, universities are using video-conferencing and video-streaming tools, and our future work will be analyzing the use of recorded lectures while using video-conferencing in multi-campus courses.

7 ETHICAL ASPECTS

In general, no personal data was recorded by the questionnaires. The first question which was asked from students was about their consent to use the data for this research. The possible answers for the first question were ("YES/No"), and if someone selected "No," the survey would terminate for them, and they could not repeat it. For the ethical issue, we have used "A" and "B" as the name of the courses and "main" and "remote" campus instead of the real name of the campuses. The main campus refers to the campus that the teacher delivers lectures and share them with the students in the other campus ("remote campus") to use the lectures either by sitting in the classroom at the same time to watch them through video projectors or to watch the recorded lectures at a later time.

REFERENCES

- Agresti, A. and M. Kateri (2011). *Categorical data analysis*, Springer.
- Al Nashash, H. and C. Gunn (2013). "Lecture capture in engineering classes: Bridging gaps and enhancing learning." *Journal of Educational Technology & Society* 16(1): 69-78.
- Bassili, J. N. (2008). "Motivation and Cognitive Strategies in the Choice to Attend Lectures or Watch Them Online." *Journal of Distance Education* 22(3): 129-148.
- Bos, N., et al. (2016). "The use of recorded lectures in education and the impact on lecture attendance and exam performance." *British Journal of Educational Technology* 47(5): 906-917.
- Cramer, K. M., et al. (2007). "The virtual lecture hall: Utilisation, effectiveness and student perceptions." *British Journal of Educational Technology* 38(1): 106-115.
- Davis, S., et al. (2009). "Lecture capture: making the most of face-to-face learning." *engineering education* 4(2): 4-13.
- Devadoss, S. and J. Foltz (1996). "Evaluation of factors influencing student class attendance and performance." *American Journal of Agricultural Economics* 78(3): 499-507.
- Ebden, M. (2010). "We're on a steep learning curve: The benefits and challenges of multi-campus university course delivery." *Research and Development in Higher Education: Reshaping Higher Education* 33: 267-277.
- Evans, C. (2008). "The effectiveness of m-learning in the form of podcast revision lectures in higher education." *Computers & Education* 50(2): 491-498.
- Freeman, M. (1998). "Video Conferencing: a Solution to the Multi-campus Large Classes Problem?" *British Journal of Educational Technology* 29(3): 197-210.

- Griffin, D. K., et al. (2009). "Podcasting by synchronising PowerPoint and voice: What are the pedagogical benefits?" *Computers & Education* 53(2): 532-539.
- Groenwald, S. L. (2018). "The challenges and opportunities in leading a multi-campus university." *Journal of Professional Nursing* 34(2): 134-141.
- Gupta, A. and N. S. Saks (2013). "Exploring medical student decisions regarding attending live lectures and using recorded lectures." *Medical Teacher* 35(9): 767-771.
- Gusfield, J. R. (1994). "The reflexivity of social movements: Collective behavior and mass society theory revisited." *New social movements: From ideology to identity*: 58-78.
- Gysbers, V., et al. (2011). "Why do students still bother coming to lectures, when everything is available online?" *International Journal of Innovation in Science and Mathematics Education (formerly CAL-laborate International)* 19(2).
- Hjelsvold, R. and A. Bahmani (2019). "Challenges in Repurposing Single-Campus Courses to Multi-Campus Settings." *Læring om læring* 3(1).
- Jesshope, C. (2000). The use of multi-media in internal and extramural teaching. Proc Lifelong Learning Conference, Citeseer.
- Katz, E., et al. (1973). "Uses and gratifications research." *The public opinion quarterly* 37(4): 509-523.
- McHugh, M. L. (2013). "The chi-square test of independence." *Biochemia medica: Biochemia medica* 23(2): 143-149.
- McQuail, D. (1987). *Mass communication theory: An introduction*, Sage Publications, Inc.
- Morris, N. P., et al. (2019). "Lecture recordings to support learning: A contested space between students and teachers." *Computers & Education*: 103604.
- Nordmann, E. and P. McGeorge (2018). "Lecture capture in higher education: time to learn from the learners."
- Rubin, A. M. (2009). *Uses-and-gratifications perspective on media effects*. Media effects, Routledge: 181-200.
- Stanca, L. (2006). "The effects of attendance on academic performance: Panel data evidence for introductory microeconomics." *The Journal of Economic Education* 37(3): 251-266.
- Szeto, E. (2014). "Bridging the Students' and Instructor's Experiences: Exploring Instructional Potential of Videoconference in Multi-Campus Universities." *Turkish Online Journal of Educational Technology-TOJET* 13(1): 64-72.
- Traphagan, T., et al. (2010). "Impact of class lecture webcasting on attendance and learning." *Educational technology research and development* 58(1): 19-37.
- Urista, M. A., et al. (2009). "Explaining why young adults use MySpace and Facebook through uses and gratifications theory." *Human Communication* 12(2): 215-229.
- Van den Bossche, J., et al. (2012). "The use of weblectures and its effect on learning in higher and university education." Retrieved March 18: 2013.
- Woo, K., et al. (2008). "Web-based lecture technologies: blurring the boundaries between face-to-face and distance learning." *ALT-J* 16(2): 81-93.