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Asynchronous Instructional
Videos During COVID-19
Emergency Remote Teaching:
Student Experiences Within a
New Zealand ITP

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Remote Teaching: Student Experiences Within a New Zealand ITP

By Wajira Dassanayake, Gayani Hewagama and Sarah E. Kirk

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Asynchronous Instructional Videos During COVID-19 Emergency Remote Teaching: Student Experiences Within a New Zealand ITP

Wajira Dassanayake, Gayani Hewagama and Sarah E. Kirk

Abstract

The COVID-19 pandemic created unprecedented challenges for tertiary education institutions worldwide. The crisis placed enormous pressure on educational institutions as they were required to pivot suddenly to teaching fully online. In New Zealand, Tertiary Education Organisations (TEOs) were forced to close on Wednesday 25 March 2020 after New Zealand moved to Alert Level 4,¹ necessitating the sudden implementation of online teaching. The purpose of this study is to investigate the effectiveness of pre-recorded instructional videos in three selected courses taught by a tertiary education institution, a member of the Institutes of Technology and Polytechnics (ITPs) New Zealand. These videos were specifically developed as supplementary resources to support learners in Semester One 2020, when this cohort faced numerous challenges in the COVID-19 lockdown. Specific course evaluation questions were distributed to students as a cross-sectional online survey to capture students' perceptions of the pre-recorded instructional videos and Zoom lecture recordings introduced in selected courses. Data were analysed using descriptive statistics. The findings of this pilot study indicate that the pre-recorded videos, combined with opportunities for the learners to interact on an online platform, enabled students to learn autonomously and effectively at their own pace, thereby creating overall student satisfaction.

1. Alert Level 4 is a lockdown, in which all people should stay at home. <https://covid19.govt.nz/alert-system/about-the-alert-system/#alert-level-4-%E2%80%94lockdown>

Introduction

The COVID-19 pandemic brought a sudden change in the education sector, given the suspension of face-to-face delivery and online teaching and learning being the only option. Around the globe, millions of educators began teaching online, connecting with students in a virtual classroom (Bao, 2020). In New Zealand, Tertiary Education Organisations (TEOs) suspended face-to-face classroom teaching on 25 March 2020 due to a nationwide lockdown. However, during this period the New Zealand Government required the continued provision of educational services remotely online. In response to this Government directive, TEOs endeavoured to deliver uninterrupted services to learners by moving to emergency remote teaching (ERT) online. However, this presented several challenges, one of which was the inability to engage in assisting those students who needed additional support with technical-based content.

Traditional face-to-face (FTF) teaching involves delivering course content and facilitating learning activities within the classroom environment synchronously. On the other hand, the virtual learning environment (VLE), where learning and teaching are digitally conducted, allows for both synchronous and asynchronous learning (Hodges et al., 2020). Educational resources are provided via a learning management system (LMS) for learners to digitally interact with, whilst also engaging online with the lecturer and their peers. A blended learning environment (BLE) is regarded as a hybrid educational strategy that combines some degree of FTF and virtual elements (Graham, 2006). Technology-embedded innovative learning activities and strategies are devised to improve student engagement through interactive activities, to support academic success, and overall learner–teacher satisfaction (Lento, 2016).

This study reports the case of a degree programme in one Institute of Technology and Polytechnic (ITP) in New Zealand, which adopted a combined approach by integrating synchronous Zoom conferencing with asynchronous teaching resources made available to learners via Moodle, the institution's LMS. Under normal circumstances, students in this degree programme are afforded synchronous, in-person support and guidance with technical-based content, troublesome knowledge and threshold concepts in the classroom or during office hours. Students would typically experience a learning environment that is face to face (FTF) along with a minimal amount of blended learning via Moodle (Figure 1). Given this was no longer possible, lecturers chose to provide detailed, comprehensive instructional videos with step-by-step instructions that could be used alongside designated learning activities. Students were able to view the instructional videos asynchronously while working on problems, thereby having a virtual approximation of a teacher on hand.

Given that ERT did not allow for significant redesign due to unforeseen circumstances, this restricted teachers' ability to provide synchronous guidance to students grappling with troublesome knowledge and threshold concepts, which would generally occur in the face-to-face environment. In order to mitigate the challenges in the ERT environment, asynchronous

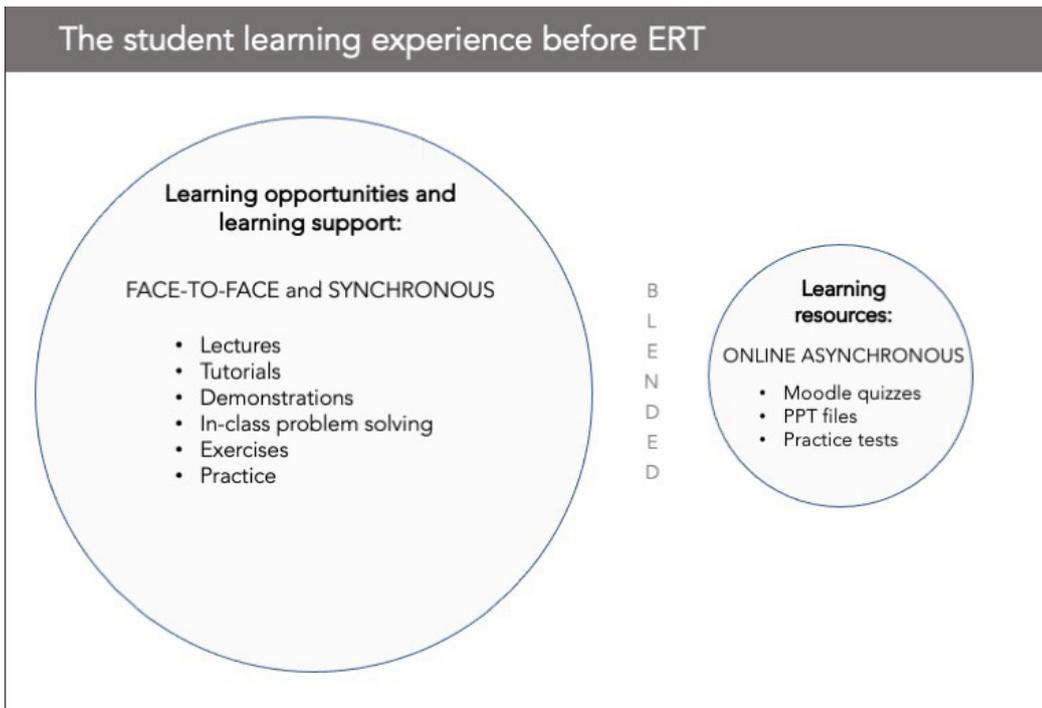


Figure 1. The student learning experience before ERT.

instructional videos were introduced to approximate in-person teacher support.

Our research empirically examines students' perceptions of the effectiveness of pre-recorded asynchronous instructional videos for improving the online learning experience and engagement of students during the COVID-19 lockdown in Semester One, 2020. This research is a pilot, based on data collected during the COVID-19 lockdown period from individual course evaluations of selected accounting and statistics courses, given the troublesome knowledge and threshold concepts inherent in these disciplines. Course evaluation feedback provides data and the opportunity to evaluate student perceptions of the effectiveness of pre-recorded instructional videos in selected courses during emergency remote teaching (ERT) during the COVID-19 lockdown in Semester One, 2020.

Literature review

In reviewing the relevant literature, it was apparent there was a dearth of research on ERT given the abrupt and unusual circumstances of COVID-19 and its impact on tertiary teaching. Consequently, it was necessary to extrapolate from existing online teaching and learning research in this literature review.

ONLINE TEACHING STRATEGIES

It is important to differentiate blended learning from the rapid shift that occurred in response to the pandemic. Blended learning is a combination of

face-to-face instruction and distance education delivery via online platforms, where both methodologies integrate into the learning process (Lento, 2016); however, the sudden shift did not allow for thoughtful integration of methodologies as outlined by Lento. The term 'emergency remote teaching' (ERT) has arisen to encapsulate the experiences of educators worldwide. Hodges et al. (2020) define ERT as "a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances" (p. 3).

Blended learning relies heavily on technology to support the delivery of course content outside class time, whether synchronous or asynchronous. Providing asynchronous video content affords students autonomy over their self-directed learning. In the traditional face-to-face method, student interaction and course delivery occur mainly inside the classroom. Technology enables delivery of specific content asynchronously and external to the classroom using the affordances of pre-recorded instructional videos, an online learning management system (LMS), whiteboard voiceover (WBVO), video lecture capture (VLC) and online course textbooks (Lento, 2016; Maxfield & Hay, 2020; Steele & Schramm, 2012). These methods enable an educator to redesign online classroom time to focus on active student-centred learning. However, this kind of redesign is time consuming, particularly if upskilling is also needed. ERT during a pandemic did not afford time to redesign or upskill.

According to the literature review of several recent articles (Hodges et al., 2020; Stefanile, 2020; Rahiem, 2020), ERT differs from online and blended delivery in that it does not involve planned course delivery from beginning to end; it is a temporary shift to online delivery due to a crisis circumstance such as the COVID-19 pandemic. ERT is fully remote teaching provided as a solution to crisis circumstances instead of face-to-face or blended delivery, where teaching will return to the normal classroom once the emergency or crisis has ended. The primary purpose of ERT is the continuation of education to learners, providing access to educational resources quickly and reliably during a crisis, without suspending teaching.

Given the pivot to ERT during the current pandemic, teachers were thrust into a virtual classroom, defined as an "asynchronous online learning environment" (Falloon, 2014, p. 188). Online ERT relies on asynchronous communication to deliver course content (Hodges et al., 2020). The benefits of asynchronous online learning include learner independence, including the choice of the location and time of the study. However, recent research (e.g., Hodges et al., 2020; Rahiem, 2020) indicates that ERT involves both synchronous and asynchronous online communication. Regular interaction between teachers and students via synchronous technologies is important, given this "improves performance in tests, allows deep and meaningful learning opportunities, increases retention rates and builds learning communities" (Schullo et al., 2007, p. 332). During the COVID-19 pandemic, educational institutions transitioned from traditional face-to-face learning to online communication synchrony such as Zoom and Teams. While this might work under normal circumstances, ERT introduces other issues and challenges for students and their learning, including internet connectivity deficits, crowded living and lack of sufficient technical support to meet high demand, thereby impacting on and limiting opportunities for synchronous interactions. Synchronous sessions combined with asynchronous instructional

videos can enrich learning opportunities for students (Falloon, 2014), however opportunities for synchronous learning were limited.

Pre-recorded videos are one way in which to support the ERT classroom approach and, in particular, were very useful in the COVID-19 environment. Furthermore, videos allow students to skip, pause, rewind and replay, thereby learning at their own pace (Woolfitt, 2015). Videos combine auditory and visual elements, enabling students to absorb the material in various ways. Students have the opportunity to take notes while watching the video and use the video to support problem-solving, and they may review the video multiple times. Our literature review finds that there is a gap in the literature regarding the use of asynchronous instructional videos by educators in the New Zealand tertiary sector.

CHALLENGES IN ERT

In this section, we focus on the challenges faced by tertiary educators in a New Zealand institution in the ITP sector during the COVID-19 lockdown and how technology was used to overcome such challenges.

One of the challenges in the online learning environment, either ERT or blended learning, is to create learning material, resources and experiences for students that equal or approximate the affordances of a face-to-face classroom environment. It also presents the opportunity to rethink and reimagine teaching and learning strategies (Maxfield & Hay, 2020; Zhang et al., 2020). Videos have brought a significant change to the traditional teaching environment. Some lecturers have embraced this concept, while others have been reluctant given their lack of the requisite skills, experience, confidence, understanding or expertise to teach effectively using video (Woolfitt, 2015). "Teaching into the camera" is not as easy as it seems, and requires an adjustment of established teaching practices and skill (Woolfitt, 2015, p. 8). Both lecturer and students need to be supported to develop skills and increase understanding of the technology. Under normal teaching circumstances, such upskilling may be achievable if appropriately resourced, however ERT did not allow for this endeavour.

DIFFERENT TYPES OF VIDEO USE: SYNCHRONOUS AND ASYNCHRONOUS VIDEO

Prior research shows learning can occur outside class by asynchronously viewing pre-recorded instructional content; hence, effectively utilising study time while providing students with a degree of autonomy over their learning (Bergmann & Sams, 2012; Islam et al., 2020; Sunasee 2020). In 2007, Jonathan Bergmann and Aaron Sams initiated the pre-recorded video concept for high-school students in the United States, aiming to improve the pass rate of absent students (Maxfield & Hay, 2020). They found most of the attending students used recorded videos to reinforce their learning and revise class lessons. This initiative led to a redesign of the classroom environment, thereby delivering the main content via pre-recorded videos before face-to-face teaching. As opposed to the traditional classroom environment, pre-recorded videos encourage students to do prior learning before class that improves student engagement (Bergmann & Sams, 2012; Maxfield & Hay, 2020). In the

instance of ERT, the affordances of the instructional videos were in support of asynchronous, independent learning rather than pre-learning before class.

Islam et al. (2020) compare and contrast the learning and teaching efficacies of Zoom lecture recordings and the targeted pre-recorded lecture videos. A Korean university was used for data collection purposes during the COVID-19 pandemic period, when face-to-face lectures were impossible. Lectures were conducted on Zoom, which enabled a facsimile of a face-to-face lecture experience; however, there is limited opportunity for feedback and guidance as afforded in face-to-face sessions. The sampled students were allowed to use pre-recorded video lectures until the midterm and then given the opportunity to use the real-time Zoom video lectures until the end of the semester. Their findings show that students preferred pre-recorded video lectures to live Zoom video lectures. The students who took part in the survey felt that the pre-recorded video lectures were more flexible, targeted, convenient and effective in comparison to the real-time Zoom video lectures; however, it is important to note that the video content provided to students was only recorded lectures and not concise, targeted instructional content.

Sunasee (2020) evaluated the educational strategies carried out by a state university in the USA during the period of COVID-19 interruptions. A combination of synchronous Zoom video lectures and asynchronous recorded videos was implemented to mimic face-to-face classes during COVID-19 interruptions. However, a lower attendance for synchronous Zoom video lectures was observed in comparison to face-to-face classes. To improve synchronous Zoom class attendance, the sessions were mainly focused on problem-solving exercises to enhance critical learning. The learners initially participated with video on; however, later synchronous Zoom sessions were completely 'video-off' Zoom-style meetings. This negatively influenced the student-teacher relationship, a vital component in face-to-face classes. Sunasee's study found that the majority of the participants felt that listening to lectures at home at their own pace was less effective for learning than if they had listened to a lecture during actual class time. However, the study reveals that those who attended synchronous Zoom sessions for synthesis problem-solving activities performed better than those students who did not attend and relied mainly on the recorded video sessions. Notably, these videos were simply lecture recordings and not concise, targeted instructional content.

Laloo et al. (2020) investigated the effectiveness of online delivery for Core Surgical Trainees (CSTs) in the Yorkshire and Humber region of the UK during the COVID-19 pandemic. With the challenges and interruptions, Yorkshire and Humber deanery designed an online teaching programme aimed at CSTs within the deanery and delivered during the COVID-19 pandemic. Teaching sessions of live recordings were delivered on Zoom and pre-recorded videos uploaded onto a Google Classroom and a YouTube channel. The recorded videos were crisp, targeted, either recorded live or pre-recorded, and were designed to be between 30 minutes and one hour in length. Core Surgical Trainees were extremely satisfied with the overall teaching series and in particular they preferred live, interactive, procedure-based, consultant-led sessions covering a myriad of surgical specialities. YouTube analytics confirm their overall satisfaction.

Gomez et al. (2020) describe the strategies implemented to continue

teaching responsibilities in a large medical school in the USA during the COVID-19 pandemic. The university the authors are attached to officially endorsed the Zoom platform for video conferencing. Lecturers who were unavailable to conduct lectures via Zoom had to pre-record lecture content. During live lectures, in addition to microphone and video capabilities, students used the chat window to ask and answer questions. Private chats between students and with the session facilitator were also available, which allowed for anonymous questions that could be shared with the group if applicable. At the end of the semester, feedback obtained from an anonymous course survey distributed by the course directors found learners felt the learning experience was very positive. None of the respondents indicated that the remote learning environment was substandard in comparison to traditional in-person learning. Suggestions were also made by the respondents to frequently use small-group breakout discussion forums.

The conclusions of Islam et al. (2020), Sunasee (2020), Laloo et al. (2020) and Gomez et al. (2020) are marginally contradictory on the effectiveness for teachers and learners of the Zoom video lectures and pre-recorded video lectures. More precisely, Islam et al. (2020) and Sunasee (2020) found pre-recorded video lectures were more preferred by learners than Zoom recordings. Laloo et al. (2020) found that learners were satisfied with the Zoom teaching series; however, they preferred live, interactive, procedure-based, consultant-led sessions lasting approximately 30 minutes to one hour. Gomez et al. (2020) found that none of the respondents indicated that the remote learning environment was substandard in comparison to traditional in-person rotations. These varied findings pave the way for us to investigate further on the effectiveness for learners and teachers of pre-recorded instructional videos and Zoom lecture recordings during the COVID-19 lockdown period in New Zealand.

Method

SAMPLE

We selected a degree programme within an ITP in New Zealand in order to pilot this research. In this programme, we introduced pre-recorded instructional videos to Business Statistics, Research Methods and Introductory Accounting courses as a learning tool to support students during the COVID-19 lockdown period in Semester One, 2020. The authors developed instructional videos to be used asynchronously for these selected courses to measure student perceptions of the effectiveness of both synchronous teaching and asynchronous instructional videos. All enrolled students in the courses were invited to participate in the study by completing an online course evaluation survey, which questioned the effectiveness of synchronous and asynchronous videos. Course evaluation feedback documented students' learning experiences during New Zealand's COVID-19 lockdown. The researchers of this study designed these course evaluations to capture students' learning experiences of synchronous and asynchronous videos.

PRE-RECORDED VIDEO DEVELOPMENT STRATEGY

Pre-recorded videos were tailored for specific activities and concepts. They allowed for the brief, incisive and targeted provision of specific knowledge, concepts or algorithms. The teacher had full command of the video planning and creation without the usual interruptions of a classroom recording, thus allowing for concise, succinct explanations or demonstrations. Videos were designed so that students could play and pause them alongside designated problem-solving activities, thereby approximating teacher support that would usually be experienced in the classroom. This led us to investigate the teaching effectiveness of pre-recorded videos in selected courses.

The pre-recorded videos were created using Movavi Video Suite, and lecture recordings were created in Zoom, because the authors had access to Movavi Video Suite, and Zoom was the video communication that the ITP supported. To influence and encourage students to view the pre-recorded videos, relevant assessment tasks were carefully linked to the videos, based on the assumption that this would incentivise students to view them. For example, selected Business Statistics assessment tasks were linked to pre-recorded instructional videos that students could view outside class to support learning, as suggested by the prior research of Steele and Schramm (2012), and Woolfitt (2015). Complex topics with troublesome knowledge were broken down to smaller video segments of approximately 5-12 minutes' duration. See, for example, Table 1, 'Pre-recorded instructional videos on regression.' The topic falls into the troublesome knowledge category, and as such, it is broken down into manageable sub-topics covering different facets of the topic.

Figure 2 (below) summarises the students' ERT learning experience during the COVID-19 lockdown, with a combination of synchronous and asynchronous lectures, activities and resources. Figure 3a (below), a screenshot from an instructional video that breaks down the steps required to enter a data set using a scientific calculator, is an example of the ERT approach. During the lockdown, multiple learning facets, namely instructor, classroom, technology, school support network and the institution's support services, were integrated to help students during Semester One, 2020. Face-to-face classes took place in the first four weeks (before the outbreak, from the week beginning 24 February to the week beginning 16 March). When New Zealand moved to Alert Level 4 (on 25 March), the institution adopted an online teaching strategy with significant technological and pastoral support. Throughout lockdown, all lectures occurred online using Zoom and all asynchronous resources were accessible via Moodle. The institution supported students who experienced technological constraints (internet capacity and/or hardware issues). In this pilot project, we examine the learning effectiveness of the pre-recorded videos. Screenshots of two video recordings are given in Figures 3a and 3b (below).

Table 1. Pre-recorded instructional videos on regression	
Title of the subtopic	Video duration
How to enter bivariate data into your scientific calculator to obtain regression coefficients	Approx. 7 mins
Estimate the regression line and the regression coefficients using XY Scatter Plot in Excel	Approx. 8 mins
Estimation of regression coefficients using fx Insert Function in Excel	Approx. 4 mins
Simple regression output using Regression tool in Data Analysis ToolPak in Excel	Approx. 5 mins
Multiple regression output using Regression tool in Data Analysis ToolPak in Excel	Approx. 4 mins
How to write the regression equation in full	Approx. 3 mins
Make a prediction using simple and multiple regression outputs	Approx. 7 mins
The goodness of fit of the simple and multiple regressions	Approx. 6 mins
Underlying assumptions of ordinary least squares (OLS) regression model	Approx. 11 mins
Test of significance and interpretation of the coefficients	Approx. 6 mins
Total Time	Approx. 61 mins

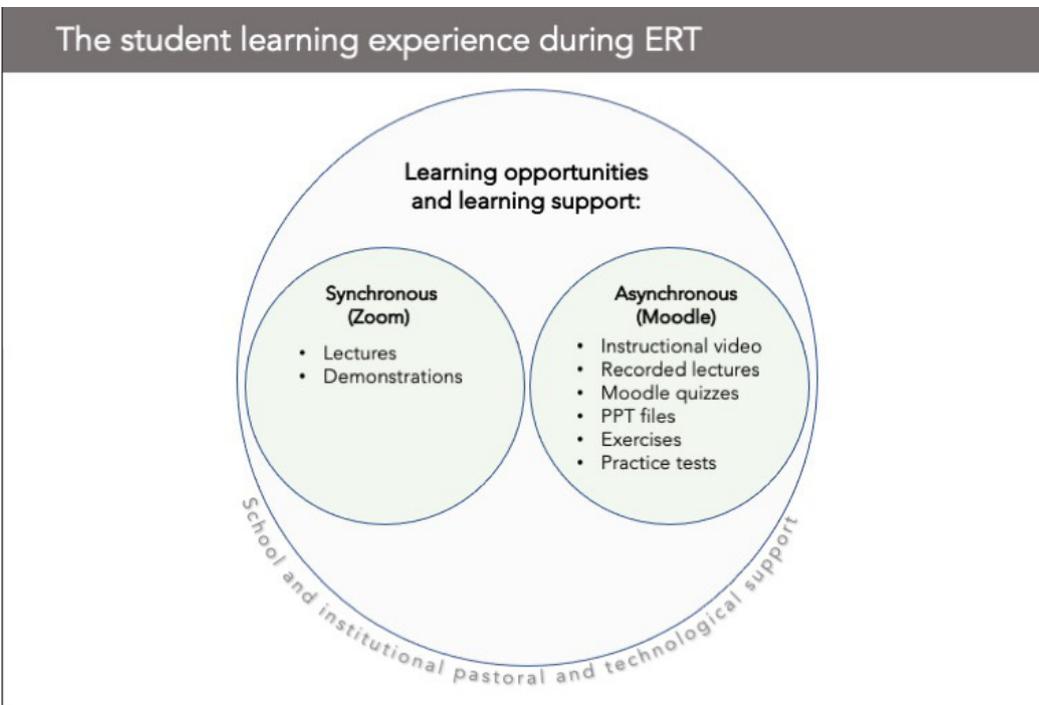


Figure 2. The student learning experience during ERT.

How to enter following data set into CASIO FX-82 MS OR Standard Scientific Calculator?

Weekly family expenditure (\$) and weekly income (\$) of a sample of families in Auckland												
Weekly Expenditure (\$) M	200	230	190	250	300	280	350	280	400	560	320	450
Weekly income (\$) X	900	1,000	850	1,200	1,500	1,400	1,700	1,350	2,000	2,900	1,550	2,200

Step ONE: Select the correct **REG** mode
 STEPS → **MODE 3 1** **REG** will appear on the display panel

Step TWO: Clear the memory
 STEPS → **SHIFT MODE 1 =**

Step THREE: Enter the above **DATA** (in below) order

STEPS → **X_i** , **Y_i** **M+** 

900 , 200 M+	1000 , 230 M+	850 , 190 M+
1200 , 250 M+	1500 , 300 M+	1400 , 280 M+
1700 , 350 M+	1350 , 280 M+	2000 , 400 M+
2900 , 560 M+	1550 , 320 M+	2200 , 450 M+

Figure 3a. Screenshot from an instructional video.

Introduction to Ordinary Least Squares (OLS)

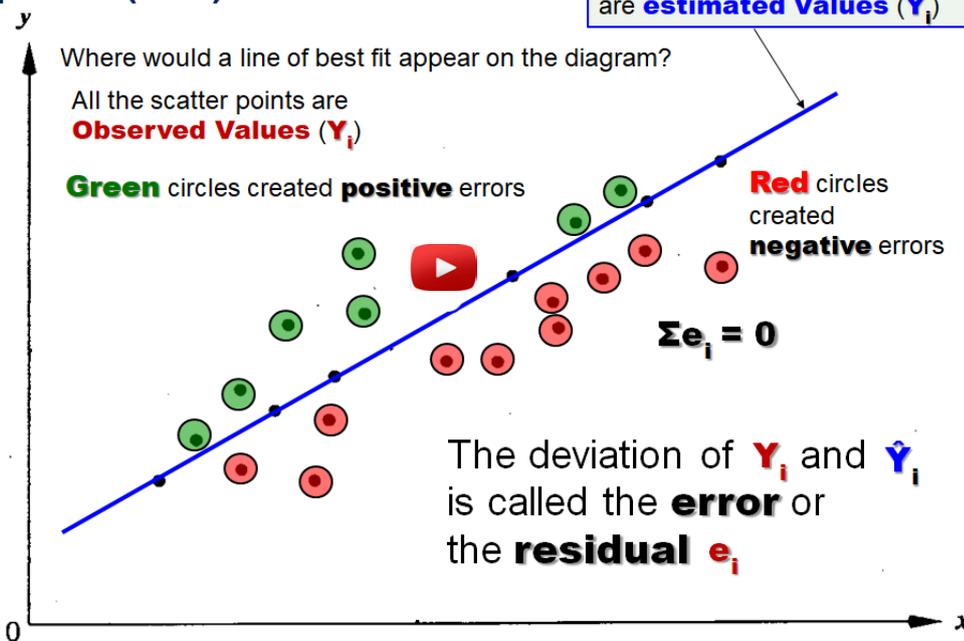


Figure 3b. Screenshot from an instructional video.

DATA COLLECTION

The course evaluation questions were designed to capture students' learning experience of both asynchronous instructional videos and synchronous Zoom lecture recordings in the selected courses mentioned previously during the COVID-19 lockdown. Nemoto and Beglar (2014) highlight that Likert-scale questions are effective to capture opinions, attitudes or feelings about particular strategies or issues. Based on the guidelines proposed by Nemoto and Beglar (2014), the course evaluation responses were developed on a Likert scale to measure the level of agreement; the final question was constructed as a reflective question to capture a well-rounded understanding of student perceptions of the effectiveness of asynchronous instructional videos and synchronous Zoom lecture recordings. Anonymous online course evaluation surveys were sent to the course participants using Survey Monkey. The course evaluation questions are presented in Table 2.

Q 1	Are you an international student?
Q 2	Did you find the pre-recorded instructional videos useful?
Q 3	How best describes your viewing of pre-recorded instructional videos?
Q 4	How many pre-recorded instructional videos and Zoom lecture recordings have you watched?
Q 5	Ability to pause and rewind pre-recorded instructional videos and Zoom lecture recordings multiple times (if needed) allowed me to study at my own pace and learn the material more effectively.
Q 6	We want to hear your voice on pre-recorded instructional videos and Zoom lecture recordings. Please be as constructive as possible.

Results and discussion

A total of 40 students was enrolled in the three courses surveyed (Business Statistics, Research Methods and Introductory Accounting). Of these 40 students, 35 responded to the survey, giving an overall response rate of 88%. Likert scales were used for survey questions (strongly agree to strongly disagree), except for Q3, which had four categories of responses as follows: 1 = did not watch any videos, 2 = watched mostly to review examples, 3 = watched selected material that I did not understand in class and 4 = watched from beginning to end. We report the standard descriptive summary statistical analysis suitable for any data measurement scale to avoid anomalies.

Cronbach's alpha reliability coefficient was calculated to measure the reliability of the research instrument; in this study, it was the course evaluations. The rule of thumb is 0.7 or above indicates a good internal consistency of the items (George & Mallery, 2003). Cronbach's alpha reliability coefficient is 0.763, and the standardised item alpha is 0.815, which suggest that the items have relatively high internal consistency.

Descriptive statistics were used to analyse Q2 to Q5. Central tendency measures of mean, median and mode were used to identify the location of the central points of the data evaluated. Standard deviation, interquartile range, and range were used to measure the variability of data. Skewness was used to measure the lack of symmetry of the analysed data. Table 3, below, provides a descriptive summary of statistics for five of the surveyed questions.

Responses for Q1 indicated 43% were international students, and 57% were domestic students. We performed “F-test two sample for variances” and “independent sample T-test” in Excel to find out whether there was a statistical difference between international and domestic learners in relation to their responses for Q2–Q5. The F-test was used to check the data set to fulfil the homogeneity of variance assumption before performing the T-test. F-test results confirmed the variances of the two groups were equal. Hence, a T-test was performed assuming equal variances and the results are not statistically significant. These findings confirm that pre-recorded asynchronous instructional videos and synchronous Zoom lecture recordings are equally useful for both domestic and international learners.

For Q2, 97.8% of the respondents found the pre-recorded instructional videos were beneficial resources for their studies. The variability ranges from 0 to 0.32, confirming that the individual data points tend to be clustered tightly around the centre. A strong negative skewness for Q2 confirms that most students strongly agreed with the usefulness of pre-recorded videos. These findings were confirmed by qualitative feedback provided by the students, in which one participant in the Business Statistics course commented on the quality of the pre-recorded videos:

“Pre-recorded videos were well structured, short and crisp. They targeted critical elements in statistics which could be harder to absorb only with the PowerPoint lectures...”

In particular, Business Statistics involves technical content and mathematical equations that can be hard for students to absorb in the first instance; hence pre-recorded videos helped them to understand these complex constructs more easily and are an effective way of teaching and learning.

Q3 is about the extent of students’ viewing of pre-recorded instructional videos, and responses ranged from 3.74 to 4, indicating at least 93.5% of the respondents viewed the pre-recorded instructional videos from the beginning to the end. None of the respondents selected the response ‘Did not watch,’ and a negative skewness confirms that most students utilised the pre-recorded instructional videos fully. The variability ranges from 0.44 to 1, ensuring that the individual data points tend to be clustered tightly around the centre. Learners’ feedback on viewing videos reinforces the results of Q3. Some of the feedback extracted from the Business Statistics course evaluation given below validates the findings of the quantitative analysis.

“It is way easier to refer to the recording or a video than just PowerPoint and textbook.”

“[V]ideos were very good useful resources to my learning, and I can take my own time to play and stop the videos to learn the instructions.”

Table 3. Overall sample statistics on pre-recorded instructional videos, Semester 1, 2020					
	Q1	Q2	Q3	Q4	Q5
Scale	Yes/No	5-Scale	4-Scale	5-Scale	5-Scale
International students	43%	–	–	–	–
Domestic students	57%	–	–	–	–
Mean	–	4.89	3.74	4.23	4.77
Median	–	5	4	4	5
Mode	–	5	4	5	5
Standard Deviation	–	0.32	0.44	0.77	0.49
Kurtosis	–	4.69	-0.69	-1.16	4.04
Skewness	–	-2.53	-1.16	-0.43	-2.11
Minimum	–	4	3	3	3
Maximum	–	5	4	5	5
Upper Quartile	–	5	4	5	5
Lower Quartile	–	5	3	4	5
Total Sample	40	40	40	40	40
Responses	35	35	35	35	35
Response rate	88%	88%	88%	88%	88%
Where					
Q1 = Are you an international student?					
Q2 = Did you find the pre-recorded instructional videos useful?					
Q3 = How best describes your viewing of pre-recorded instructional videos?					
Q4 = How many pre-recorded instructional videos and Zoom lecture recordings have you watched?					
Q5 = Ability to pause and rewind pre-recorded instructional videos and Zoom lecture recordings multiple times (if needed) allowed me to study at my own pace and learn the material more effectively.					
5-Scale: 5 = Strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly disagree					
5-Scale Q4: 5 = All; 4 = Most; 3 = Moderate number; 2 = A few; 1 = None					
4-Scale Q3: 4 = Beginning to end; 3 = Selected; 2 = Review examples; 1 = Did not watch					
<i>Source: Survey Monkey 2020-S1, Te Puna Ako</i>					

“[I]t enables us to take ownership of our studies at our own space.”

For Q4, 80% of the respondents viewed both pre-recorded instructional videos and Zoom lecture recordings, confirming these resources were helpful supplementary blended resources for our students. The variability for Q4 is low, and the data is centred towards the mean. A negative skewness confirms that more students viewed most of the pre- and post-recorded instructional videos. Sunasee’s study (2020) also shows students’ engagement and active learning is enhanced when asynchronous and synchronous teaching methods are combined. In our research sample, we tested the students’ perception of both pre-recorded (asynchronous) and Zoom recordings (synchronous). The quantitative analysis shows all these participants emphasised the usefulness of pre-recorded videos and recorded Zoom classes for their learning. The students’ qualitative feedback supports these findings. One learner commented that videos helped them to clarify certain challenging concepts and improve their understanding of Business Statistics classwork:

“The videos clarified certain concepts I was uncertain about. By viewing videos before the class as well as after, I have a better understanding of the work. I liked the quality of the video. It was audible and very informative.”

A learner from an accounting course mentioned the usefulness of viewing classroom videos asynchronously for understanding the troublesome knowledge:

“[T]he lecture videos are really helpful to go back to in case there are some materials that I didn’t understand during class or material that I want more clarity on.”

A student from the Business Statistics course commented on both asynchronous and synchronous videos keeping them fully engaged in class activities:

“[V]ideos and recordings do what is hard to do in class: if you know that you can refer back to the lecture and find additional instructions on hard parts later as many you need, you can actually fully engage in in-class activities.”

Responses for Q5 range from 4.77 to 5, which means at least 95% of the respondents felt that both pre-recorded instructional videos and Zoom lecture recordings motivated them to take ownership of their studies and become active learners. The primary reason is that videos enabled them to play, pause and rewind multiple times at their convenience. The variability ranges from 0.49 to 2, confirming that the individual data points tend to be clustered tightly around the centre. A negative skewness of -2.11 confirms that more students became active learners with video resources. Qualitative feedback from the students strengthens these quantitative findings, and one such comment was based on the usefulness of videos, in which a Research Methods student commented:

“[T]he videos were great in a way that you could go back to it anytime and get your questions answered...to conclude it’s a relief

that its accessible anytime.”

These participants were very enthusiastic about having videos and emphasised the usefulness of videos for their learning. Consistent with the findings of Islam et al. (2020), our study results also show that students favour pre-recorded videos because of the flexibility and convenience of asynchronous learning. A student from Business Statistics commented: *“I loved the fact they are always there,”* because students can watch the videos at any time they want during the course. Also, students appreciated our efforts, saying: *“Thanks a lot for creating these videos specially during the period of COVID-19 interruption”; “Well done...for developing such resources.”* These responses fully reinforce the findings of the quantitative analysis.

Our results support the findings of Islam et al. (2020) and Sunasee (2020), where they suggest learners prefer asynchronous video lectures due to flexibility and convenience of learning. However, Laloo et al. (2020) and Gomez et al. (2020) are marginally contradictory on the use of asynchronous lecture videos because they argue that learners prefer Zoom due to interactivity and consultancy-led sessions. Our study indicates that the combination of both asynchronous and synchronous video-based teaching produces more effective learning for students.

Conclusion

Overall, students highly commended the value and effectiveness of the video resources for their learning. Most students made positive comments on short, topical pre-recorded videos. We developed the pre-recorded videos with an assumption that these resources would positively contribute to our students’ learning journey. The course evaluations were conducted to capture the students’ first-hand learning experience of the pre recorded asynchronous videos during the lockdown period. During this period, there was significant disruption, and valuable teaching time was lost. Our primary motive was to give the fullest support to our learners by creating these pre-recorded videos to facilitate our teaching and learning. We intended to capture the learning experience of the students who faced COVID-19 interruptions, and this study enables us to share our findings among the wider community. The findings of this study endorse that pre-recorded asynchronous instructional videos are a useful learning tool. We initiated this research as a pilot study, and we anticipate expanding the pre-recorded instructional Echo360 videos and Zoom lecture recording-based blended teaching approach in our future deliveries.

Like all studies, our research is not without limitations. As a pilot study, the main limitation is the small sample size, which is confined to a single school in a selected ITP. Future research is necessary to validate the findings of this study by incorporating a larger sample, possibly as a longitudinal study. We also suggest applying a robust data-collecting methodology with a standardised questionnaire for future data collection. In addition, future researchers can focus on addressing the challenges posed in ERT, and investigate effective pedagogies for online teaching and learning.

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