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Achievement in Training: Recorded Video Compared to Face-to-Face Environments

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Abstract- During the 2020-2021 years, it has been necessary for organizations to rethink how they conduct their daily operations in light of COVID-19 restrictions. One of the many activities within organizations is to provide new and recurrent training to their employees. In a similar vein, universities also had to make adaptations to instructional methods. This change provided an opportunity to compare student achievement in two different instructional modalities; one with lectures delivered in a full face-to-face format, and the other with recorded video lectures delivered in online platform. Both formats were conducted in morning and afternoon sessions. Three sets of test results were measured to compare the outcomes between two years. This study had mixed results, two of the three test results sets between the years showed no significant difference between face-to-face and recorded video lectures, while one of the three test results provided evidence that the results were different between instructional methods. The results of this study could provide applicable information to organizations and help to provide a roadmap for providing training in different formats. It is noteworthy that providing instruction in recorded video formats could be less expensive to organizations and also provide more flexibility for employees to fit recurrent t into their daily schedules.

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Achievement in Training: Recorded Video Compared to Face-to-Face Environments

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Abstract- During the 2020-2021 years, it has been necessary for organizations to rethink how they conduct their daily operations in light of COVID-19 restrictions. One of the many activities within organizations is to provide new and recurrent training to their employees. In a similar vein, universities also had to make adaptations to instructional methods. This change provided an opportunity to compare student achievement in two different instructional modalities; one with lectures delivered in a full face-to-face format, and the other with recorded video lectures delivered in online platform. Both formats were conducted in morning and afternoon sessions. Three sets of test results were measured to compare the outcomes between two years. This study had mixed results, two of the three test results sets between the years showed no significant difference between face-to-face and recorded video lectures, while one of the three test results provided evidence that the results were different between instructional methods. The results of this study could provide applicable information to organizations and help to provide a roadmap for providing training in different formats. It is noteworthy that providing instruction in recorded video formats could be less expensive to organizations and also provide more flexibility for employees to fit recurrent t into their daily schedules.

I. INTRODUCTION

While online and face-to-face delivery have been widely examined, recent research has noted that studies need to measure learner achievement within various fields in order to determine if an online environment is a suitable substitute for a face-to-face environment (Arias, Swinton, & Anderson, 2018). In this study, achievement in a course taught by 'lecture only' was examined by comparing test results between taped video instruction delivered in an online platform and in person face-to-face environments. The aim of this research was to determine if there is a significant difference in learning outcomes by comparing the results of three test scores between students who received video lectures with students who received face-to-face lectures. It is important to note that the face-to-face environment did not have the lectures recorded. Thus, if a student missed a session, it was not possible to recreate the lecture, and the student would need to rely upon the notes of other students or discussing the subject with the instructor. This would be similar to an employee missing a training session in a face-to-face environment. In that type of a situation, the employee would need to reschedule the training for another day.

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In the online lecture environment, the lectures were recorded and posted so that learners could watch the lectures as many times as they desired. Prior research has noted that recorded lectures have both positive and negative attributes, and while higher education providers may recommend their use, it is important to measure the effectiveness of this strategy (O'Callaghan, Neumann, Jones, & Creed, 2017). Pace, intelligibility, media quality, media diversity, and congruence have been identified as important dimensions (Lange & Costley, 2020), and organizations need to define how to best reach and engage their employees through best practices.

The importance of this study is the analysis of the relationship between student achievement on standardized tests in two different environments. In this regard, it was possible to analyse if taped lectures in an online environment were a good substitute for non-recorded lectures in a face-to-face environment. Three tests taken from standardized test banks were given in the two different environments. This study shows generalizability to organizations that provide training to their employees. The main question that organizations may ask is, "Are taped training sessions given in an online platform a reasonable alternative to live face-to-face training"?

II. LITERATURE REVIEW

Studies have noted that learners seem to value the lecture recordings, and say that they do frequently view prior lectures in order to understand content and concepts (Leadbeater, Shutterworth, Couperthwaite, & Nightingale, 2013; O'Callaghan, Neumann, Jones, & Creed, 2017; Traphagan, Kusera, & Kishi, 2010; Pons, Walker, Hollis, & Thomas, 2013). If students are utilizing the recordings for their own learning benefit, and to have a richer understanding of concepts and content, then it seems that performance should also increase with this use.

It is important to measure achievement between learners taking courses with online lectures versus face-to face lectures (Kinash, Knight, & McLean, 2015). Studies have found mixed results between these two environments. Some studies have found that test scores are similar between online delivery and face-to-face delivery (Bigelow, 2009; Brockfeld, Müller, & de Laffoli, 2018). Other studies have found that a majority of students believe that listening to lecture recordings has

a positive impact on their course grades. Some learners use the recordings to supplement live lectures and other students use them as a substitute for live lectures. However, others voiced that they believed they learned more from face-to-face lectures (Brockfeld, Müller, & de Laffoli, 2018). Some noted that attending face-to-face lectures are more motivating and there is additional value added by having contact with the instructor (O'Callaghan, Neumann, Jones, & Creed, 2015).

Students might not perceive that the online lectures are a good substitute for face-to-face lectures, yet, one of the benefits of having lectures recorded and available in an online environment is that students can review material at their own pace while watching lectures again. This can help them to understand difficult material or preparing for test situations (Brockfeld, Müller, & de Laffoli, 2018; Panther, Writght, & Mosse, 2012). Lee and An (2018) noted that online lectures are becoming more commonplace in a variety of settings, including those outside of academia. While learners have a positive attitude toward online lectures, it was stated that future research needs to compare the use of online lectures in various fields.

III. RESEARCH QUESTIONS AND HYPOTHESES

RQ: How do achievement scores compare between a course with recorded lectures delivered in an online environment and a live non-recorded lecture?

It was hypothesized that there would be no significant difference in the grades of three standardized tests between the two environments.

IV. RESEARCH METHODOLOGY

This study was carried out on a university course in Australia. Many universities have historically been taught in a face-to-face environment, and the lectures are not recorded. This is similar to many organizations that have historically provided training in face-to-face environments. Due to the COVID-19 restrictions, it was necessary to give the lectures in an online environment. These lectures were recorded, which allowed for students to re-watch the lecture materials. The only difference in years 1 and 2 was the delivery of the lectures. The lectures in Year 1 were in a face-to-face environment, but not recorded, and in Year 2 the lectures were delivered and saved online. In comparing the course outlines of the two deliveries, there were no other changes.

Student achievement was measured by three standardized tests within the course. One set of tests was taken in a face-to-face environment (Year 1) and the other set of tests was taken in the environment where there were recorded lectures in an online platform (Year 2). In both years, the tests were delivered in an online environment. The two groups were independent, and

the test scores were compared between the two groups. An F-test showed that the two samples had unequal variances. The three test scores between the two groups were compared by using a t-test: Two-sample assuming unequal variances.

V. DATA COLLECTION

Data collection consisted of the deidentified grades in both of the course delivery sessions. There were 84 students in Year 1, and there were 131 students in Year 2. The scores on each of the three tests were compared between Year 1 and Year 2.

VI. DATA ANALYSIS

For test 1, there was not a significant difference in the scores between those who took the test in Year 1 with face-to-face lectures, and those who took the test in Year 2 with recorded online lectures ($p = 0.36$). The results suggest that there is no significant difference in test scores between students who had face-to-face lectures, and those who had online lectures.

For test 2, there was not a significant difference in the scores between those who took the test in Year 1 with face-to-face lectures, and those who took the test in Year 2 with online lectures ($p = 0.75$). The results suggest that there is no significant difference in test scores between students who had face-to-face lectures, and those who had online lectures.

For test 3, there was a significant difference in the scores between those who took the test in Year 1 with face-to-face lectures, and those who took the test in Year 2 with online lectures ($p = 0.01$). The results suggest that there is a significant difference in test scores between students who had face-to-face lectures, and those who had online lectures. The grades for those who had face-to-face lectures appeared to have a significantly higher score than those who had online lectures.

The outcome of analysing the test results between the two groups of students show mixed results. Two of the three tests did not show a significant difference in test scores between the two environments. However, in the third test, there is a significant difference between the two groups, and the findings indicate that the face-to-face lecture group achieved higher scores than the online group. This seems to indicate that the benefits and challenges related to video online learning environments need to be examined to determine if online lectures may be a good substitute for face-to-face lectures when measuring the dimension of student achievement.

VII. DISCUSSION

The weakness of this study is that it was purely objective in nature. Future studies might examine subjective information perhaps by using questionnaires,

interviews, or focus groups so that student perceptions can be better understood. In a follow-up study, it might be interesting to add in a qualitative piece, which could either compare student feedback between the two courses, or to ask students this term about their perception of the online lectures. There might be differences with how students utilize materials, or their experience with online versus face-to-face lectures. Future studies might also consider examining outcomes in training environments. Much work-related training is conducted in a face-to-face environment, and it would be worthwhile to examine if the same level of understanding can be learned through an online delivery.

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