

Bridging Pedagogical Frontiers: A Comprehensive Inquiry into the Transformative Impact of Digital Pre-Recorded Lectures on Health Sciences Education Across Diverse Institutions

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Abstract

The utilization of video as an instructional tool in higher education exhibits substantial promise as a multimedia application. Integrating video content into online support materials for specific modules has the potential to enhance learners' comprehension of the material and their preparedness for assessments. This study aims to assess the effectiveness of digital pre-recorded lectures among Health Sciences undergraduates in two institutions. The researcher distributed confidential questionnaires to 180 subjects across both institutions, ensuring consent through detailed explanations on a Google Form. Subsequently, lecturers delivered pre-recorded lectures as part of the teaching and learning process. An analysis of the mean perception scores for both institutions revealed statistically significant differences ($p < 0.05$), with mean scores of 0.003. The study also examined pre- and post-lecture performance scores, indicating a significant improvement for both institutes. University A exhibited mean scores of 46.23 (SD=8.14) and 75.75 (SD=9.43) pre- and post-lecture, respectively. University B demonstrated mean scores of 68.85 (SD=5.95) and 70.58 (SD=2.97) pre- and post-lecture, respectively, with $p < 0.05$. The findings suggest that digitally pre-recorded lectures are almost equally beneficial for both institutions. To capitalize on these advantages, a standardized package for this pedagogical approach should be implemented and made accessible to Health Sciences undergraduates.

Keywords: Adult Learning, Evaluation Methodologies, Improving Classroom Teaching, Lifelong Learning, Teaching/Learning Strategies

Introduction

In the global landscape of education, particularly in the realm of online learning, the utilization of video and audio-visual materials is on a steady rise. A recent technological advancement, screen recording tools, empowers instructors to craft video lectures for comprehensive subject explanations (Suhayati and Haryati, 2021). The educational landscape has undergone significant transformations due to the pandemic, resulting in a surge in remote learning and the widespread adoption of pre-recorded lectures to deliver course content (Schnee et al., 2019). Extensive studies highlight a robust connection between students' endorsement of video lectures and their perception of effective learning outcomes (Robertson and Flowers, 2020).

Recognized for their efficacy in enhancing learning performance, video lectures offer both flexibility and instructional presence in virtual environments (Reid et al., 2022). This research aims to contribute to the ongoing discussions and future investigations, with a specific focus on Health Sciences students. By delving into the implementation of pre-recorded lectures, the study seeks to explore its impact on student preferences and potential improvements in academic performance. Such insights hold the promise of broader benefits for Health Sciences education.

Materials and Methods

A cross-sectional study has been conducted with selected medical imaging students at University A and University B. This design is particularized to find out the effectiveness of implementing the digital pre-recorded lecture. Ethical approval was granted from the local ethics committee on 20 January 2022 (Reference: KPJUC/RMC/SOHS/EC/2022/395). To achieve these goals, a set of questionnaires was adapted, and are subtle to be applied. A population of this study was involving undergraduates Health Sciences from both higher learning institutions. Questionnaires were distributed by researcher to all 180 participants, with the content of the questionnaires explained in detail and stated that all responses were be highly confidential and to be used for study purposes only. Participation in this study is completely voluntary. All data collection is gathered from students via a google form. Then, the teaching and learning process of pre-recorded lecture was given by the respective lecturers. A set of validated questionnaires used in this study was splatted up into three sections. The first section consists of demographic information of the subject such as age, race, programme, and experiences with pre-recorded lecture, while the second section consists of the perception of pre-recorded lecture. A quick test was then measuring the performance of the teaching method for the lecture. The questions were given to the participants before and after the lecture. From the study, the effectiveness of the teaching method was measured. In this study, the event of interest was the effectiveness of pre-recorded lecture for both institutions. The descriptive information analyzed the students' test score for the lectures, to give a descriptive sense of the typical score, and to see the effectiveness of the lecture. Correlation is used to figure out the relationship between perception and performance for both institutions related to the medical imaging students, respectively.

Results

A questionnaire was completed by 184 participants, slightly below the targeted sample size of 242. Table 1 presents demographic information about the respondents. The majority

were female (134 participants, 73%), with the remaining 50 (27%) being male. The average age of all respondents was 20 years (SD \pm 10), ranging from 17 to 35 years.

Table 1

Summary of the key demographic data for the respondents (n = 184).

Variables	n (%)
Age	
17 to 25	130 (71)
26 to 35	54 (29)
Gender	
Male	50 (27)
Female	134 (73)
Level of study	
Diploma	89 (48)
Bachelor degree	95 (52)

Analysis of Table 2 reveals a significant difference in the mean perception scores between undergraduate Health Sciences students at University A and University B ($p=0.003$), with a 95% confidence interval for the mean difference of (-0.74, 2.49).

Table 2

Comparison of perception on digital pre-recorded lecture between University A and University B (n=184)

Perception	University A	University B	t (df)	p-value
	Mean (SD)	Mean (SD)		
	17.88 (4.91)	17.00 (5.22)	1.08 (182)	0.003

A paired t-test was employed to examine the mean difference between student scores on pre and posttests for digital pre-recorded lectures across two institutions, as detailed in Table 3. The results revealed a notable variance in the efficiency of the pre-recorded teaching method between University A and University B students.

For University A, the mean difference in scores was substantial: pre-lecture test (M=46.23, SD=8.14) and post-lecture test (M=75.75, SD=9.43). In contrast, University B exhibited a mean difference for the pre-lecture test (M=68.85, SD=5.95) and post-lecture test (M=75.58, SD=2.97). Significantly different scores were observed for University A ($p=0.000$), indicating a notable improvement, while University B showed less significance ($p=0.168$). Consequently, the mean difference in scores favored University A over University B.

Overall, for this study, undergraduates in Health Sciences at University A, on average, outperformed their counterparts at University B. Notably, participants from both institutions demonstrated higher post-test scores compared to their pre-test scores, highlighting the efficacy of the teaching, and learning process.

Table 3

Comparison of performance on digital pre-recorded lecture between University A and University B (n=184)

Institution	Performance	Mean (SD)	Mean diff.	t (df)	p-value
University A	Pre-lecture	46.23 (8.14)	29.52	76.31 (131)	0.000
	Post-lecture	75.75 (9.43)			
University B	Pre-lecture	68.85 (5.95)	6.73	1.34 (51)	0.168
	Post-lecture	75.58 (2.97)			

The analysis explored the correlation between students' perception and performance in both higher learning institutions. Table 4 indicates a weak correlation in both cases, with an observed correlation coefficient, r , of -0.04 for University A ($p=0.659$) and 0.17 for University B ($p=0.237$). Notably, University B exhibits a positive relationship in its results, albeit still weak.

Table 4

Correlation between performance and perception of undergraduates' health sciences students (n=184)

	Performance
Perception of University A undergraduates	-0.04
Perception of University B undergraduates	0.17

Discussion

Undergraduate Health Sciences students at both University B and University A demonstrated a positive perception of pre-recorded lectures, specifically acknowledging the benefits of time efficiency and improved focus, as highlighted in Table 4. These findings align with insights obtained from student interviews in previous studies, supporting the favorable sentiments towards pre-recorded lectures. Previous research done by Schreiber et al (2010) emphasized the advantage of screen-recorded videos in virtual learning, allowing students to revisit materials at their convenience. The flexibility and accessibility of virtual learning, as noted by Smith and Francis (2022), enabled students to delve deeper into course content. The ability to save and watch recorded lectures offline further contributed to a positive learning experience (Suhayati & Haryati, 2021). Video lectures were also reported to enhance attention and concentration (Kosterelioglu, 2016), aligning with the significance of attention in the learning process (Cicekci and Sadik, 2019).

Descriptively, students in University A outperformed those in University B, indicating a preference for pre-recorded lectures in the former. This echoes the sentiment that pre-recorded lectures could serve as a viable substitute for live lectures, as suggested by (Lohmae et al., 2023; Wammes and Smilek, 2017). A subclass of this teaching strategy, the "flipped classroom," was discussed in a study proved by Mohebbi et al (2022), highlighting increased motivation and engagement among students who interacted with video content. Notably, participants from both institutions exhibited increased scores in post-tests, reinforcing the positive impact of digital pre-recorded lectures on academic performance.

However, despite these positive perceptions, a Pearson's correlation analysis showed no statistically significant linear correlation between students' perception and performance for both institutions. This suggests that how students perceive the effectiveness of pre-recorded lectures may not directly correlate with their actual performance (Shuja et al. 2019). Descriptively, both institutions showed a negative relationship, indicating a lack of direct correlation between perception and performance.

Various factors, including differing academic levels among institutions, prior learning experiences, and the transition from high school to college, may contribute to the absence of a significant correlation. Heterogeneity in students' backgrounds, expectations, and preferences underscores the complexity of evaluating the success of pre-recorded lectures (Azlinda et al., 2010; Heong et al., 2011; Tumiran et al., 2021; Liao and Wu, 2023). Moreover, the cited sources reveal diverse patterns in the usage of pre-recorded lectures among medical students. Understanding these varied perspectives is crucial for educators to tailor strategies that enhance engagement and learning (Dixson, 2010; Roblyer, 2000).

In conclusion, while pre-recorded lectures offer numerous advantages, the absence of a significant correlation between perception and performance emphasizes the need for a nuanced understanding of students' experiences and preferences in diverse learning environments. Educators should consider these factors when integrating pre-recorded lectures into the curriculum.

Conclusion

In summary, this study presents promising prospects for the future, offering potential benefits to both students and educators. The findings indicate that Health Sciences undergraduates in various higher learning institutions exhibit a positive inclination toward pre-recorded lectures, highlighting noteworthy variations in perception and performance scores, supported by a descriptive correlation. Recognizing the comparable advantages of digitally pre-recorded lectures, a recommendation is made for a standardized global implementation of this teaching approach, aiming to enhance the learning experience for Health Sciences undergraduates.

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