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MICHAEL ELSDON
Northumbria University, United Kingdom

VIDEO CAPTURE TO ENHANCE LEARNING

Abstract:

In recent years, many educational institutions have invested a great deal of money on refurbishing their teaching environment by equipping them with various e-learning tools and resources in an effort to engage with the demands of the modern student. Following the Covid 19 Pandemic a number of institutions are moving toward a blended mode of delivery. Moreover, a number of universities have invested heavily in the use of video capture technology to support learning. In its simplest form it is not uncommon for each lecture to be recorded live and deposited on the e-learning portal for students to watch in their own time. It is hoped that this will improve student performance and engagement with the subject. Whether simply recording of a lecture will have any effect on exam performance or student engagement is debatable. To this end, the aim of this study is to investigate the link between pure lecture capture and exam performance. We will also examine more effective use of video capture to both engage and improve student performance.

The work presented in this paper is based upon a focussed on the use of video capture and to ascertain its effect on student performance and engagement.

The focus of this study is a level 5 module on a BEng (Hons) Electronic Engineering degree. We have created three distinct video types: Type 1 was pure lecture capture; type 2 was 15 minute introductory videos to introduce key engineering concepts to be provided to students prior to attending the each lecture; type 3 was short videos of how to solve key engineering problems. We have created 8 videos for each category. Within this paper we will correlate student engagement with each video type and their exam results. It is demonstrated that pure video capture has little effect in exam performance. Conversely, student engagement with introductory videos and problem solving videos show a positive correlation. We will also present results of a student survey on the perceived usefulness of each video.

We will also provide some key thoughts for implementing video capture in other disciplines.

Keywords:

Video Capture, Blended Learning

JEL Classification: I29, I21

1.1 Introduction

In previous years, the traditional student attending university could be described as being academically committed, motivated and highly interested in their studies. It has been suggested that this type of student learns regardless of the teaching style, and the student effectively 'teaches' themselves. It could be argued that the 'traditional' student has a deep approach to learning and can access the material in numerous ways, but crucially via the medium of the lecture. In recent times, the increased popularity of higher education has meant that the 'traditional' student is no longer the norm. Although this student type still exists, students now come from a wide range of backgrounds, not necessarily via A-level route. Students may come from a non-traditional vocational background. Another group, who may not be as committed or motivated by the subject and simply sees the course as a passport to a well-paid job. The challenge for the lecturer is to employ a range of teaching styles to accommodate the changing face of the student population. It has been argued that the traditional lecture has become an outdated mode of delivery which involves the lecturer imparting information to students on a particular topic. Whilst this may not be entirely accurate, there may be some truth in it.

In recent years, many educational institutions have invested a great deal of money on refurbishing their teaching environment by equipping them with various e-learning tools and resources in an effort to engage with the demands of the modern student. Following the Covid 19 Pandemic a number of institutions are moving toward a blended mode of delivery. A number of universities have invested heavily in the use of video capture technology to support learning. In its simplest form it is not uncommon for each lecture to be recorded live and deposited on the e-learning portal for students to watch in their own time. It is hoped that this will improve student performance and engagement with the subject. Whether simply recording of a lecture will have any effect on exam performance or student engagement is debatable. To this end, the aim of this study is to investigate the link between pure lecture capture and exam performance. We will also examine more effective use of video capture to both engage and improve student performance.

A number of studies have been conducted on the use of video capture and its effect on attendance, engagement and academic performance. In a study of year 2 undergraduate Medical science students Leadbeater et al [1] reported high student engagement with video capture. Despite 75% engagement little impact on academic performance was noted. Similar results were reported in [2] which also reported little difference in grades, but reduction in attendance. In another study on Veterinary Medical Science students it was reported that a greater percentage of students than faculty perceived lecture capture as beneficial to learning [3]. In another study, it was concluded that lecture capture is more likely to be of benefit to low achieving students [4]. The research so far on the effectiveness of video capture appear to show conflicting evidence on the benefits of video capture. Some studies have shown no significant correlation between lecture capture and student grades, others have shown that students scored higher on their final examination as a result of accessing lecture recordings, but their overall course grades did not significantly improve [5,6,7].

In view of this, the work presented in this paper is focused on the use of video capture and to ascertain its effect on student performance. Moreover it examines if there is any link between

different video types and exam performance. We will also present the results of a student survey to highlight the perceived usefulness of each video type.

1.2 Results and discussion

The focus of this study is a level 5 module on a BEng (Hons) Electronic Engineering degree. We have created three distinct video types:

Three categories of videos were created: pure lecture capture; short duration introductory videos; and short duration videos of engineering problems. Sixteen full lecture videos and sixteen short videos were created and made available. One year of data is analysed in terms of viewing time per video, average viewing time per student, number of views per student and correlation between video engagement and exam performance. We have created 8 videos for each category. The three video categories are briefly described below.

Video Type 1: Entire lecture content.

In this section we discuss the effects of simple lecture capture. This involved recording lectures directly and uploading them to student electronic learning portal. Sixteen lectures, with a typical length of 50 minutes, were created. Two years of data, from 2015_17, are analysed in terms of viewing time per video, average viewing time per student, number of views per student and correlation between video engagement and exam performance.

The graph in figure 1a illustrates the average viewing time per student. The graph in figure 1b illustrates the number of video views per student. The graph in figure 1c illustrates the correlation between video views and exam performance.

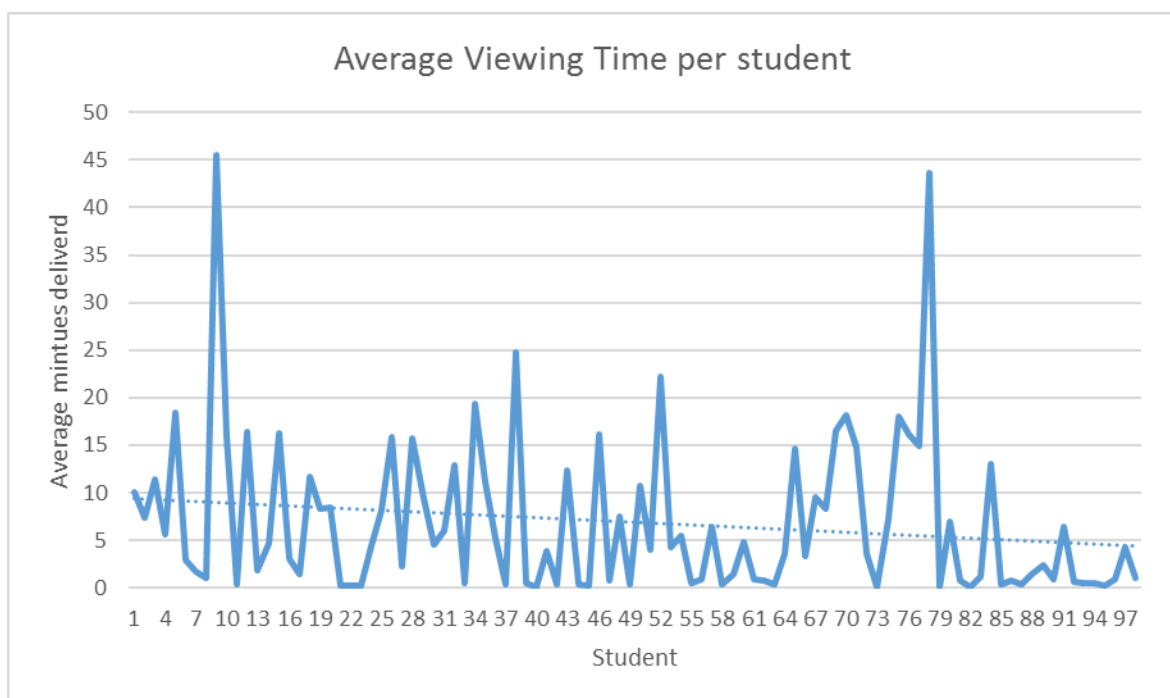


Figure 1a: Average Viewing time for student

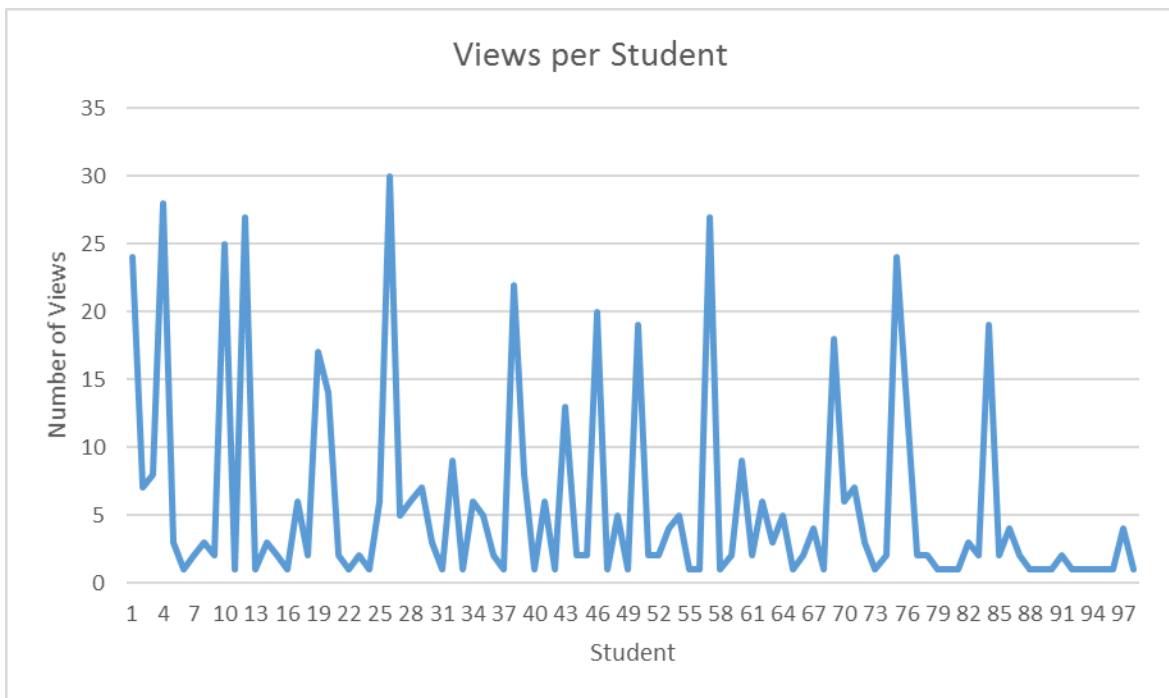


Figure 1b: Number of video views per student

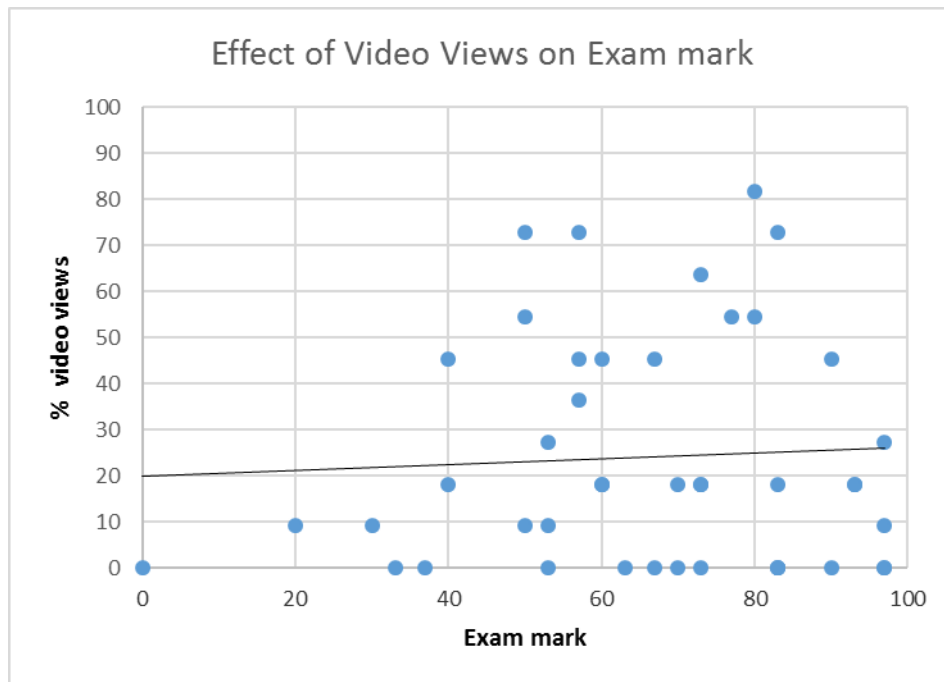


Figure 1c: Correlation between video views and exam performance

From figure 1a, bearing in mind that the average video length was 50 minutes, it can be seen that very few students watched the entire video. If we take an average value from this graph, this

equates to an average viewing time per student of less than 20 minutes. From figure 1b, we can see that only a small number of students watched all videos, with an average views per student of 5.8. If we examine figure 1c, we can see that there appears to be little correlation between video views and exam performance. The key conclusion from this is that the use of lecture capture in its simplest form has little benefit for student learning.

Video Type 2: 15 minute introductory videos.

Eight Small bite-size videos are created. These videos are a condensed summary of the key topic that will be covered during lecture. Each video had a maximum length of 15 minutes to fit in with viewers' average attention span. These are then expanded on during the lecture. By encouraging students to view these before the lecture, students arrive at the class with some background knowledge. This allows us to more time for greater discussion, so students can engage more during the lecture. It is also possible to use the flipped classroom approach if we employ these videos. This also fits in with Glassers' research [8] that people learn 95% of what they have to teach someone else. This is an active and high level engagement activity and appears to be the most effective method of encouraging deep learning.

The results in figure 2 correlate the percentage of videos each student has watched against exam performance. From the data a positive correlation exists, which highlights the usefulness of such videos.

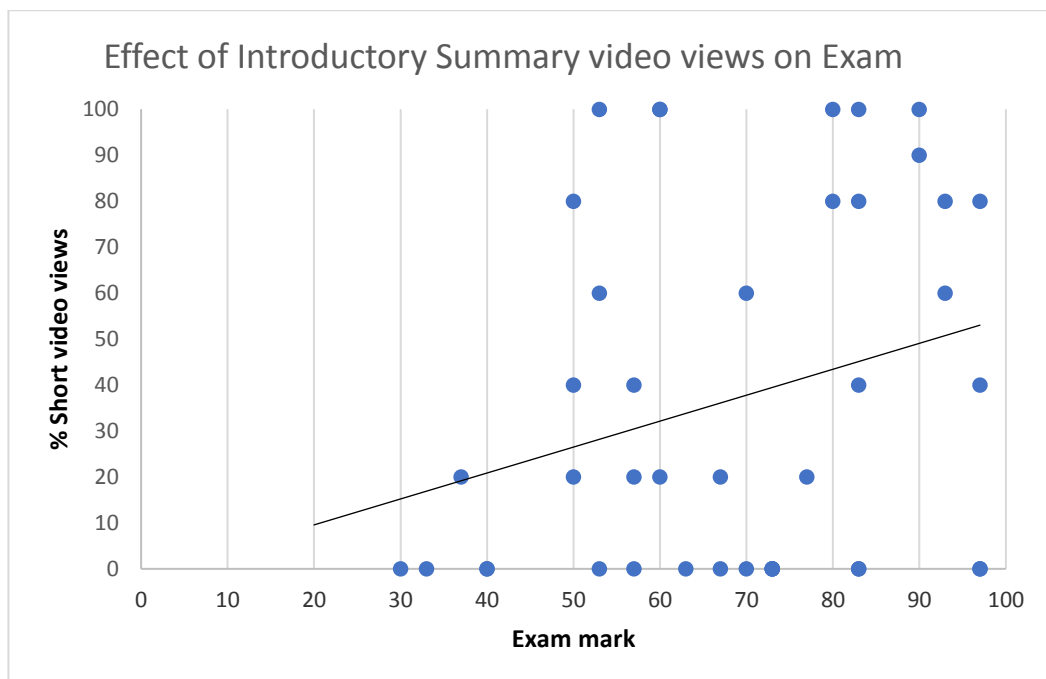


Figure 2 Correlation between introductory videos and exam performance

Video Type 3. Online videos of worked examples

Eight videos containing annotated worked example of key engineering problems. They are intended to be additional support material for students to view in their own time. These are limited to 15 minutes. This is a passive and low level activity, but is still beneficial for revision purposes. The results in figure 3 correlate the percentage of videos each student has watched against exam performance. From the data a positive correlation exists, which highlights the usefulness of such videos.

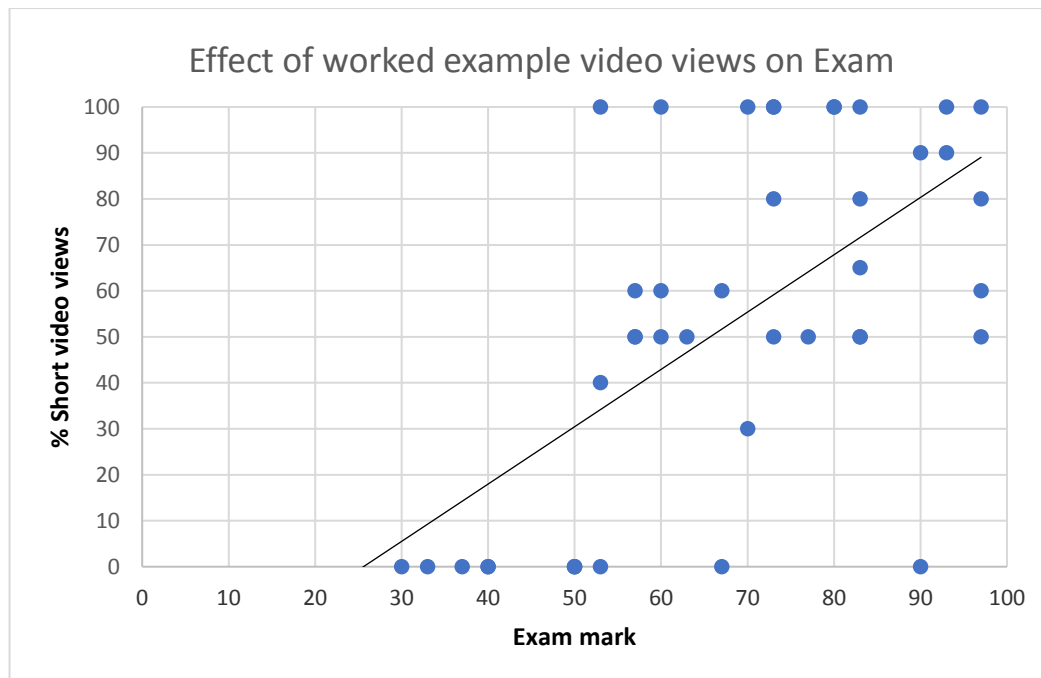


Figure 3 Correlation between worked example videos and exam performance

1.3 Student Perception

For this purpose, a survey was carried out among students in order to obtain their opinion on the relative importance of each video type. Question 1 asked students to rate the usefulness of each video type on a scale of 1 (not useful)-5 (extremely useful). The results indicate only 44% of students found pure lecture capture extremely useful, compared to 84% and 96% for introductory videos and worked example videos respectively.

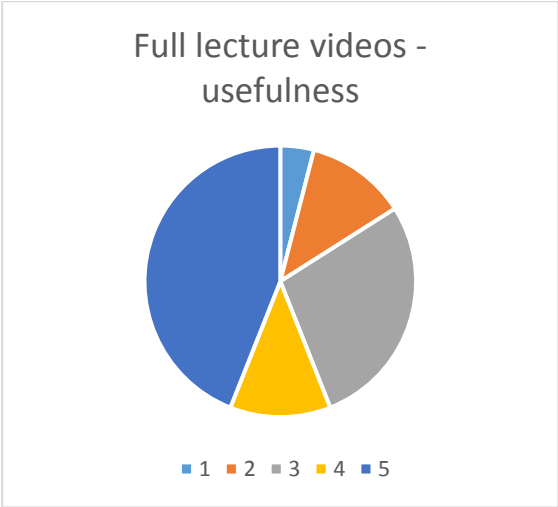


Figure 4a Perceived usefulness of pure lecture capture

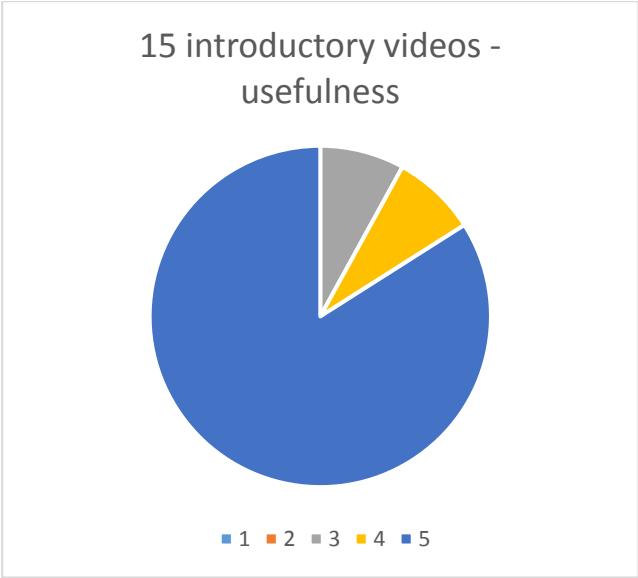


Figure 4b Perceived usefulness of short introductory videos



Figure 4c Perceived usefulness of short worked example videos

In the second part of the survey, students were asked to rank each video type in order of importance. The results shown in figure 5, indicate only 16% of students ranked pure lecture capture as the most important, compared to 32% and 52% for introductory videos and worked example videos respectively.

1 – 15minute summary 2. Entire Lecture. 3 – Worked Example videos

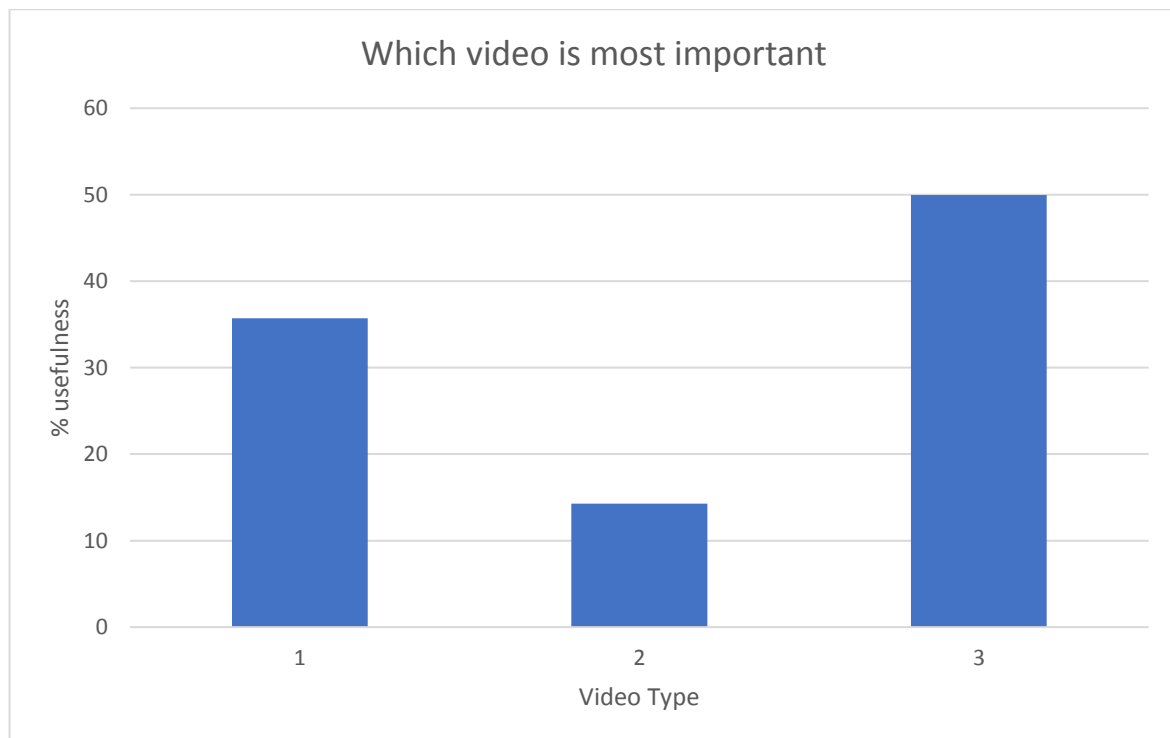


Figure 5 Relative Importance of each video type

1.4 Conclusion

This study has examined the effect of lecture capture and online support on student engagement and exam performance. It has been demonstrated that pure lecture capture in its most basic form has little effect on student engagement and exam performance. It would appear that there is more value in creating short online support videos to supplement the lectures. These views are supported by students perception of different types of video capture. These conclusions must be taken with caution and we cannot imply that video capture will suddenly transform the student learning experience and improve performance. It could also be argued that if we have a skilled teacher who is able to explain key concepts they can do this regardless of the technology involved. You could argue that e-learning tools do not imply an effective delivery. However if used correctly they can enhance delivery. The key question that needs to be addressed when investing in technology is whether the teacher is able to use this effectively.

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