Home and Away: Can Online Video-Based Learning Reduce the Distance?

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Abstract

Online videos are increasingly being used in distance learning. This study analyzes adoption patterns of online video-based learning, based on enrollment data, and examines the influence of distance on the proclivity of new students to enroll for online video-based classes. It explores the effect of both geographical distance and constraints that may prevent students from studying in traditional face-to-face classes. It is assumed that MBA students are more likely to have such constraints, e.g., working full-time. Data analytics was used to extract and investigate a sample of 7,217 undergraduate (BA) and graduate (MBA) students who started their studies at The Open University of Israel during the years 2011-2012. The main findings regarding the effect of geographical distance on new student enrollment to online video-based classes were inconclusive. Conversely, the proclivity of new MBA students to enroll to the video classes was significantly stronger than that of undergraduates. Those graduates whom their first course was video-based were more inclined to continue their studies than undergraduates who started with video, and more than graduates who took their first course face-to-face. However, undergraduates that started with video were more inclined to dropout than their peers who started with a face-to-face course.

Keywords: online video lectures, diffusion of innovation, effectiveness of instructional technologies, adoption patterns of online video-based learning, student retention.

Introduction

Distance learning has been offered to those who could not attend traditional face-to-face classes at least since the late 19th century, and was based on correspondence via mail (Moore & Kearsley, 2011). Later, more communication channels and technologies, such as radio and television were utilized for distance learning. Recently, online videos are increasingly being used in distance learning, due to their affordability and availability (Copley, 2007).

Student retention is a well-known challenge of distance learning (Woodley, 2004), and much of the difficulty is attributed to the lack of social interaction (Salmon, 2004). Online video-based classes may have the potential to increase student retention and their achievements in distance as well as in blended learning environments, by providing them a sense of social interaction (Geri, 2012). However, students seem reluctant to adopt video-based online learning. Prior studies indicated that most students preferred traditional in-class studying, even when they were offered a rich e-learning environment that included video lectures, exercises and personal online tutoring (Guri-Rosenblit, 2005, 2009). But, this may be changing, as people are getting used to conduct more activities online. Can contemporary online video-based courses reduce the distance? As the global trend of online video courses increases, it is essential to examine its effectiveness, and identify ways to improve it.

Theoretical Background and the Research Questions

Online video may help students who cannot attend class (Wieling & Hofman, 2010). Moreover, interactivity, which was rarely offered to students in the past, may increase the effectiveness of these videos (Zhang, Zhou, Briggs, & Nunamaker, 2006). Until lately, discussion boards were considered as one of the primary tools of e-learning (Harman & Koohang, 2005), there was not much use of online video for learning (Nachmias & Ram, 2009), and few studies examined it. Whatley and Ahmad (2007) summarized various ways of using video for supporting teaching and learning, and described their own use of online video for recording summary lectures to aid students in their revision of face-to-face lectures. Two more studies (Brecht, 2012; Brecht & Ogilby, 2008) investigated video lectures that were used to support a traditional classroom course, and their results indicated that these videos might have helped the students pass the course.

Asynchronous, as well as synchronous online videos are used in diverse organizational environments for employee training, and their effectiveness has been studied in areas such as healthcare (Dror, Schmidt, & O'connor, 2011), and food safety in food services (Opolski Medeiros, Barletto Cavalli, Salay, & Proença, 2011). However, the applicability of such studies for higher education contexts is limited, since in work environments employees may be more obliged to undergo the video sessions, and successfully complete online assignments that are based on them in order to retain their job. The same may hold true for higher education students, who want to obtain their academic degree, and must take a compulsory course, which is offered only via online video classes. Therefore, as described in the methodology section, this study focuses on situations where the students have a choice, and may decide whether or not to take the online video class.

This study analyzes adoption patterns of online video-based learning, based on course enrollment data, and focuses on the influence of distance on student proclivity to enroll for online video-based classes. The first interpretation of distance in the context of the study, which is conducted in Israel, is geographical distance of the student from central cities that offer opportunities for face-to-face studies. The second meaning of distance in our context is metaphorical, and relates to constraints that may reduce student ability, or prevent them from studying in traditional face-to-face settings. It assumes that in general, MBA students may have more difficulties to attend face-to-face class meetings, since they usually work full time, and have other demands on their time. While this may hold true for some undergraduates, the underlying assumption is that overall the demands on MBA students' time will be stronger.

This paper is part of a comprehensive study, which examines the implications of online video use in distance and blended learning on student retention and achievement. The research questions that this paper addresses are:

- Does the proclivity of new students to enroll to online video-based classes increase the farther they live from central urban areas?
- Is the proclivity of new MBA students to enroll to online video-based classes stronger than that of undergraduates?
- Is the proclivity of MBA students who studied their first course on a video-based class to continue their studies stronger than that of undergraduates who studied their first course on a video-based class? Are these tendencies different from those who studied face-to-face?

Methodology

The methodology used in this study is data analytics, which is a growing methodological trend both in research (Hershkovitz & Nachmias, 2009; Levy & Ramim, 2012; Ravid, Bar-Ilan, Baruchson-Arbib, & Rafaeli, 2007), and in business environments (LaValle, Lesser, Shockley,

Hopkins, & Kruschwitz, 2011). The study examines enrollment patterns of students at the Open University of Israel, which is a distance-learning institute with about 42,000 undergraduate students and 3,700 graduate students (Open University President's report, 2011). The university recruits 11,000-12,000 new students each year, but many of them drop out early in their studies. The students may choose a full distance-learning model or a blended learning model, which combines face-to-face meetings with online support through course websites. The meetings and websites supplement traditional means of distance education, such as books and study guides. Since 2009, video lectures were increasingly been introduced to courses.

The unit of analysis in this study is the student. The data set included records of students that were enrolled during the academic years 2011 (semesters A, B, and C), 2012 (semesters A, B, and C), and the first semester of 2013, to at least one of the following courses, which are offered at the department of management and economics:
- "Introduction to microeconomics", an undergraduate compulsory introductory course, and a supplementary course for MBA candidates.
- "Introduction to macroeconomics", an undergraduate compulsory introductory course, and a supplementary course for MBA candidates.
- "Financial theory", an undergraduate compulsory course.
- "Financial management", a compulsory course for MBA students.
- "Introduction to accounting", an undergraduate compulsory course.
- "Accounting for managers", a compulsory course for MBA students.

The first semester of 2011 was chosen as the starting point because by that time video classes were more prevalent, and students were aware of the possibility to take them. Therefore, the video courses had observability, which is one of the factors suggested by Barnes & Huff (2003) as influencing the adoption of an innovation. The sample focused on the department of management and economics for several reasons: synchronous video classes, as well as other forms of asynchronous video uses, have been deployed by the department for more than ten years; there is a successful MBA program with thousands of graduate students, and this allows comparing undergraduates and graduates; since student choices and dropout depend on many factors and circumstances, it was desired to examine a more homogeneous sample. Furthermore, there was a prior basis of an analysis of two out of the six chosen courses. Geri (2011) examined enrollment patterns of new and continuing students to the "Introduction to microeconomics" and "Introduction to macroeconomics" introductory courses, from the second semester of 2009 until the first semester of 2011. The findings indicated that only 7% of the 19,000 student decisions were to enroll to the online video-based class, during these six semesters. It was also observed that continuing students were more inclined to enroll to video class than new students.

The initial data set of this study included 18,095 student records. The first stage was cleaning the data, and removing data that is not relevant for this study. For example, the records of overseas students were removed, since they cannot enroll to face-to-face courses. Furthermore, there are a few compulsory courses that are offered only in video, and they were excluded, because the students did not have a choice.

Distance was measured in two dimensions: proximity of the reported home address of the student to the center, and by comparing undergraduate and graduate students, assuming that distance is not just a geographical parameter, and MBA students, who mostly work, and sometimes already have a new family, may be more "distant" than undergraduates. Furthermore, the center was defined as including Tel Aviv and vicinity, as well as Haifa and vicinity, since the Open University has major campuses in both cities, where students may attend face-to-face meetings. Sensitivity analyses were conducted to ensure that the students of Tel Aviv and Haifa

have similar preferences with regard to their enrolment to video classes, and indeed they did. The geographical areas outside of the center were divided into three circles, the first circle was the closest to the center, but included Jerusalem and Be'er Sheva since there is a study center in each one of these cities, which offers study groups in relatively many courses (although not as many as the central campuses). The second circle was farther, while the third circle was the farthest, and included Eilat, the Golan Heights, and the Upper Galilee.

Results

Table 1 summarizes the analysis of 7,217 student records that were extracted from the initial data set of this study, which included 18,095 records. The analysis is focused on these students' decision whether to study their first course in a face-to-face class or in an online video-based class. As shown on Table 1, the findings regarding the effect of geographical distance on new student enrollment to online video-based classes were inconclusive, $\chi^2(3, N = 7,217) = 5.64$, $p = .1305$. Even when comparing video enrollment in the central area (5.9%) to the rest areas combined (6.9%), there was no significant difference, $\chi^2(1, N = 7,217) = 2.42$, $p = .1198$.

The proclivity of new MBA students (13.8%) to enroll to online video-based classes was stronger than that of new undergraduates (5.6%), $\chi^2(1, N = 7,217) = 79.1$, $p < .0001$. Those graduates whom their first course was video-based were more inclined to continue their studies (the following reported χ^2 results relate to taking at least three additional courses, but most of the results were also significant for taking at least one additional course) than undergraduates who started with video, $\chi^2(1, N = 470) = 4.3$, $p = .0381$; and more than graduates who took their first course face-to-face, $\chi^2(1, N = 809) = 7.65$, $p = .0057$. However, undergraduates that started with video were more inclined to dropout (20.9%) than their peers who started with a face-to-face course (10.9%), $\chi^2(1, N = 6,408) = 32.72$, $p < .0001$.

Table 1. Video-based distance learning adoption patterns by geographic area and degree, and learning mode impact on student retention

Degree	BA				MBA				Total			
Learning mode	F2F	Video	Total	% Video	F2F	Video	Total	% Video	F2F	Video	Total	% Video
Total Students	**6,050**	**358**	**6,408**	**5.6%**	**697**	**112**	**809**	**13.8%**	**6,747**	**470**	**7,217**	**6.5%**
Area												
Center	2,382	118	2,500	**4.7%**	238	47	285	**16.5%**	2,620	165	2,785	**5.9%**
First circle	2,310	155	2,465	**6.3%**	252	38	290	**13.1%**	2,562	193	2,755	**7.0%**
Second circle	1,199	66	1,265	**5.2%**	184	27	211	**12.8%**	1,383	93	1,476	**6.3%**
Third circle	159	19	178	**10.7%**	23	-	23	**0.0%**	182	19	201	**9.5%**
Dropout (3)*	659	75	734		166	13	179		825	88	913	
Continued (3)	5,391	283	5,674		531	99	630		5,922	382	6,304	
% Dropout (3 courses)	**10.9%**	**20.9%**	11.5%		**23.8%**	**11.6%**	22.1%		12.2%	18.7%	12.7%	
Dropout (1)*	30	37	67		45	4	49		75	41	116	
Continued (1)	6,020	321	6,341		652	108	760		6,672	429	7,101	
% Dropout (1 course)	**0.5%**	**10.3%**	1.0%		**6.5%**	**3.6%**	6.1%		1.1%	8.7%	1.6%	

*Dropout (3) indicates students who did not enroll to at least three courses during the semesters following their first course. Dropout (1) indicates students who did not enroll to any course during the semesters following their first course.

Discussion and Conclusions

In light of the meager enrolment of students to online video-based classes, one may ask if it is worthwhile for the university to offer such classes. The data shows that the trend of enrolling to online video-based classes is slowly growing, and in due time offering such classes will become a necessity, especially for distance and blended learning universities. From the perspective of real options theory (Amram & Kulatilaka, 1999), the infrastructure and experience that the Open University is gaining as the demand for video slowly emerges, will prepare it for the future. Furthermore, those videos are currently available to all the students enrolled to courses with an online video class, and although their impact on student achievement and retention should be further studied (Geri, 2012), the students are demanding these video lectures, and perceive them as helpful (Steimberg et al., 2010). However, the goal should be to improve these video lectures, and effectively integrate them with face-to-face learning, as well as other means of online learning. The next phases of this study are aimed at gaining insights that will promote achieving the goal.

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