

Students' Adoption of Online Video-Based Distance Learning

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Abstract

Video lectures offer students a learning experience, which is more similar to in-class learning than other options of distance learning. This study examines the adoption of online video-based distance learning in a blended learning environment, where the students may choose their mode of learning. It analyzes the enrollment of online video classes in two introductory courses at the Open University of Israel, during the first six semesters in which this option was offered. In each semester, there were between 500 to 2,500 students enrolled to each of the two courses. The main findings suggest that while students prefer face-to-face learning, the availability of video lectures may help all the students enrolled in these courses improve their achievements. In order to investigate this assertion further, the study explores the effectiveness of online video-based distance learning by comparing the achievements of overseas students before and after the inception of the video lectures. Interestingly, the results indicate that so far, video lectures have not significantly improved the perseverance as well as the achievements of overseas students.

Keywords: online video lectures, diffusion of innovation, blended learning, effectiveness of instructional technologies, continued use of information systems.

Introduction

Video lectures offer students a rich learning experience, which resembles traditional in-class learning. Nowadays, technologies that enable both instructors and students to use video lectures are ubiquitous and affordable. Therefore, in the coming years, the use of video lectures as a means for distance learning, as well as for supporting traditional in-class learning is expected to increase. Video lectures may have a potential to increase both student retention and achievements in distance and blended learning environments. However, prior research indicates that due to the essential human need to socialize, most students prefer traditional in-class studying, even when they are offered a rich e-learning environment that includes video lectures, exercises and personal online tutoring (Guri-Rosenblit, 2005). Hence, it is important to study the adoption of online video-based distance learning.

Many e-learning studies examine various aspects of discussion boards, which are considered as one of the primary tools of e-learning (Harman & Koochang, 2005), or investigate the use of various internet platforms for collaborative learning. However, few studies deal with video use for learning. Whatley and Ahmad (2007) summarize various ways of using video for supporting teaching and learning, and describe their own use of video for recording summary lectures to aid students in their revision of face-to-face lectures. Brecht and Ogilby (2008) investigate video lectures that are used to support a traditional classroom course, and their results indicate that

these videos may have helped the students pass the course, since 24% of students without the videos failed the course, whereas the failure rate dropped to 6.8% for the group that had the videos available. Precel, Eshet-Alkalai, and Alberton (2008) analyzed a course that was intentionally designed for online learning, which also included some video lectures. Although the students' attitudes towards the online content, including the video lectures, were positive, Precel et al.'s (2008) findings suggest that students prefer a blended learning model to a fully online course.

There is a large body of research concerning technology acceptance (Venkatesh, Morris, Davis, & Davis, 2003), and the diffusion of innovation (Rogers, 2003). Yet, there is a need for studies that examine the adoption rate of new technologies, since this aspect has been rarely studied (Jeyaraj, Rottman, & Lacity, 2006; Geri & Naor-Elaiza, 2008). This exploratory study examines the adoption rate of online video-based distance learning in a blended learning environment, where the students may choose their mode of learning. It is based on data of about 19,000 actual enrollment decisions. Another aspect that distinguishes this research, is that there is a wide consensus that the analyzed information technology (i.e., the video lectures), which was also used by students who have chosen the traditional classes, is perceived as very helpful and effective. Over the examined period, the adoption rate has grown steadily, but never exceeded 16%. Yet, the video lectures were available to all the students enrolled in these courses, and may have helped them improve their achievements. The study compared the achievements of overseas students before and after the inception of the video lectures, In order to investigate their effectiveness. The preliminary results indicate that so far, video lectures have not significantly improved the perseverance and the achievements of overseas students.

Methodology

This study analyzed student enrollment of online video classes in two introductory courses at the Open University of Israel. The courses that were chosen are "introduction to microeconomics" (hereafter, micro) and "introduction to macroeconomics" (hereafter, macro). They are both offered at the department of management and economics, and in accordance with the open admission and academic excellence policy of the Open University, there are no prerequisites to these courses (anybody may enroll), so many students fail or drop out. Many students choose to first study micro, and in the following semester, they take the macro course. Some students study both courses during the same semester.

Video lectures were introduced in both courses on semester 2009B. The analyzed data refers to the first six semesters in which this option was offered. In each of these semesters, there were between 500 to 2,500 students enrolled to each of the two courses. Overall, the data included about 19,000 actual enrollment decisions.

Over and above the relatively large data set, another major consideration influenced the choice of these two courses as the object of this study. These video lectures are considered excellent, and their quality and usefulness are well known. So, according to prior research (Barnes & Huff, 2003) it is expected that they will be adopted by many students.

Barnes and Huff (2003), who extend Rogers' work (2003), suggest seven key innovation characteristics that were found useful in explaining innovation diffusion outcomes:

- *Relative advantage* over the practice the innovation supersedes.
- *Compatibility* with what people do.
- *Complexity*, defined as the perceived relative difficulty of understanding and using the innovation.

- *Trialability*, which is the ability to experiment with an innovation before making an adoption (or rejection) decision.
- *Observability*, defined as the degree to which the results of an innovation use are visible to others.
- *Image*, defined as the degree the adoption and use of the innovation is perceived to enhance one's image or status.
- *Trust*, defined as the extent to which the innovation adopter perceives the innovation provider to be trustworthy.

Five of the above characteristics are expected to increase adoption of the video-based lectures by the students, especially those who took the micro course and then had to decide on their macro course mode of learning, in the following semester:

- *Complexity*. The technology is simple, available, and easy-to-use.
- *Trialability*. All students who took the micro course before the macro were exposed to the videos before deciding on their mode of learning of the macro course. Continuing students who studied other courses (e.g., statistics or mathematics) before taking the micro course may have also been exposed to video lectures by other instructors.
- *Observability*. As with trialability, the videos were visible to the micro students and to continuing students. Furthermore, a study of general attitudes of students towards video lectures in ten courses that had a video option, which was conducted at the Open University during semester 2009C (Steimberg et al., 2010) indicated that 93.6% of the students thought that watching the videos may improve their understanding of the learning materials.
- *Image*. Using the internet for learning may be considered as enhancing one's image or status. This aspect was not examined, but it can be safely assumed that the use of the videos is not perceived as damaging one's image or status.
- *Trust*. The innovation provider (be it the university, the course academic team, or the instructor who teaches the video-based class) is perceived by the students as trustworthy.

The other two characteristics, relative advantage and compatibility, are not necessarily the same for all students. Some may prefer face-to-face class meetings while others may like the flexibility of the online videos, or the ability to watch and re-watch the videos on their own pace.

In order to explore the effectiveness of online video-based distance learning, the study compares the persistence and achievements of overseas students before and after the inception of the video lectures. Overseas students were chosen, and not the overall population of the students in these two courses, because they were unable to attend traditional class meetings. The other students, who were enrolled to traditional classes may have watched the videos as well as attending face-to-face class meetings, or may have chosen post factum, to abandon their class and study just from the videos. Of course, there were students who did not watch the videos at all. Overseas students may have also chosen not to watch the videos.

Results

Table 1 presents the total rate of students who have chosen video-based distance learning in each of the two courses, as well as the adoption rate of new and continuing students. As shown on Table 1 and Figure 1, the adoption rate of the video-based macro course is higher than that of the micro course. It should be noted that the population of students who study during the summer is different than that of semesters A and B. The summer students are usually more motivated and more successful. Some of them take these courses as prerequisites to MBA studies.

Table 1. Rate of students who chose video-based distance learning

| Semester | 2009B | 2009C Summer | 2010A | 2010B | 2010C Summer | 2011A |
|---------------------------------------|-------|-----------------|-------|-------|-----------------|-------|
| Introduction to Microeconomics | | | | | | |
| Total students MICRO | 2.2% | 6.4% | 4.0% | 4.7% | 15.5% | 5.6% |
| Continuing students % distance | 2.8% | 7.9% | 5.6% | 6.7% | 21.6% | 8.7% |
| New students % distance | 1.5% | 4.8% | 2.6% | 2.3% | 6.9% | 3.4% |
| * Significance | * | | * | * | * | * |

| Introduction to Macroeconomics | | | | | | |
|---------------------------------------|------|-------|------|------|-------|-------|
| Total students MACRO | 2.6% | 15.9% | 8.9% | 8.7% | 15.9% | 12.6% |
| Continuing students % distance | 2.8% | 17.6% | 9.6% | 8.8% | 16.1% | 13.4% |
| New students % distance | 0.8% | 2.8% | 2.3% | 7.7% | 12.5% | 6.0% |
| | | * | * | | | * |

* Significance of difference between new and continuing students ($\alpha= 0.05$).

In all the semesters, continuing students in both courses had higher tendency to choose the video option. This difference was significant in all the micro courses, except for the 2009 summer, but the difference was partly significant for the macro courses. Since during the six semesters there was a total of 5,464 enrollments of new students to the micro course, versus 742 to the macro course, it may be concluded that new students are less inclined to choose video-based online learning.

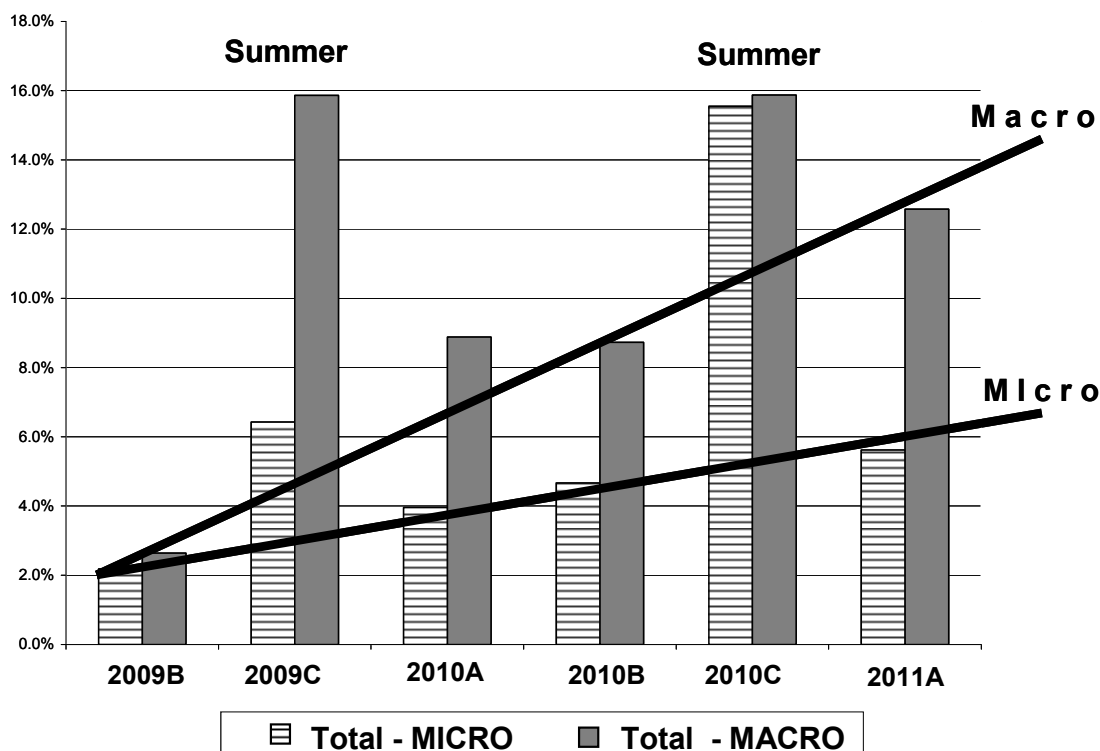


Figure 1. Total rate of adoption of video-based distance learning

Table 2 presents the achievements of overseas students during two semesters (2008 A+B) before the inception of the video lectures and two semesters (2010 A+B) afterwards. The data of 2009 was not examined because it was the year of the change (there was no video on 2009A, but some students took their exams on 2009B instead of 2009A so they may have watched the videos). There is a dropout rate of nearly 30%, but since many distance learning students discontinue their studies due to various reasons (Levy, 2007; Woodley, 2004), the percentage of those who succeeded was calculated out of those who took the exam. Although the average exam grades, as well as the average final grades in both courses were higher, none of the differences was statistically significant.

Table 2. Overseas students' achievements

| Course | Introduction to Microeconomics | | Introduction to Macroeconomics | |
|--|--------------------------------|---------------|--------------------------------|---------------|
| | 2008 A + B | 2010 A + B | 2008 A + B | 2010 A + B |
| Semesters | | | | |
| Total enrolled | 58 | 63 | 43 | 58 |
| Took the exam | 35 | 40 | 32 | 38 |
| % Took the exam | 60.3% | 63.5% | 74.4% | 65.5% |
| Succeeded | 28 | 32 | 26 | 33 |
| % Succeeded (out of those who took the exam) | 80.0% | 80.0% | 81.3% | 86.8% |
| *Average exam grade | 79.5 | 84.4 | 77.8 | 79.7 |
| SD exam grade | 11.8 | 11.8 | 11.9 | 13.8 |
| Average final grade | 79.8 | 85.3 | 79.0 | 81.9 |
| SD final grade | 9.9 | 10.1 | 11.1 | 11.8 |

* The average exam grade includes only the grades of the students who have passed the exam.

Discussion and Conclusions

The findings of this study suggest that the majority of students prefer attending traditional face-to-face class meetings. Nevertheless, the availability of videos may improve the achievements of all the students enrolled in a course. These results are in line with prior research (Guri-Rosenblit, 2005, 2009), according to which most students prefer the hybrid types of courses that combine new technologies, such as video, with conventional learning methods, and only those who cannot attend face-to-face class meetings choose distance-learning modes.

The students' proclivity towards face-to-face classes may also be explained from an attention economy perspective (Davenport & Beck, 2000, 2001; Geri & Gefen, 2007). When students are attending class meetings, they focus for three hours on studying. Whereas, when studying at home, or at work, their attention may be distracted by e-mails, phone calls, family members or co-workers who require their attention, and so forth.

The inclusion of video-based distance learning in these particular two courses is relatively new, and is less than two years old. It may be too early to draw conclusions at this stage. The results are based on about 19,000 actual decisions of students, and only 7% of these decisions were to take the video-based study group. It should be noted that "introduction to microeconomics" and "introduction to macroeconomics" are introductory bachelor degree courses, so the findings may not be relevant for more advanced courses, or degrees. More research is required in order to fully explore these issues.

This study contributes to the diffusion of innovation research literature by measuring actual technology adoption rate data, and by demonstrating that even an excellent technology, which

its fine quality and advantages are highly visible to non-users, may not be widely adopted by the potential users.

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References

- Barnes, S. J., & Huff S. L. (2003). Rising sun: iMode and the wireless internet. *Communications of the ACM*, 46(11), 78-84.
- Brecht, H. D., & Ogilby, S. M. (2008). Enabling a comprehensive teaching strategy: Video lectures. *Journal of Information Technology Education*, 7, 71-86. Retrieved November 8, 2010 from <http://jite.org/documents/Vol7/JITEV7IIP071-086Brecht371.pdf>
- Davenport, T. H., & Beck, J. C. (2000). Getting the attention you need. *Harvard Business Review*, 78(5), 118-126.
- Davenport, T. H., & Beck, J. C. (2001). *The attention economy: Understanding the new currency of business*. Boston, MA: Harvard Business School Press.
- Geri, N., & Gefen, D. (2007). Is there a value paradox of e-learning in MBA programs? *Issues in Informing Science and Information Technology*, 4(1), 163-174. Retrieved November 8, 2010 from <http://proceedings.informingscience.org/InSITE2007/IISITv4p163-174Geri322.pdf>
- Geri, N., & Naor-Elaiza, O. (2008). Beyond adoption: Barriers to an online assignment submission system continued use. *Interdisciplinary Journal of E-Learning and Learning Objects*, 4, 225-241. Retrieved November 8, 2010 from <http://ijello.org/Volume4/IJELLOv4p225-241Ger476.pdf>
- Guri-Rosenblit, S. (2005). Eight paradoxes in the implementation process of e-learning in higher education. *Higher Education Policy*, 18(1), 5-29.
- Guri-Rosenblit, S. (2009). Distance education in the digital age: Common misconceptions and challenging tasks, *Journal of Distance Education*, 23(2). Retrieved November 8, 2010 from <http://www.jofde.ca/index.php/jde/article/view/627/886>
- Harman, K., & Koohang, A. (2005). Discussion board: A learning object. *Interdisciplinary Journal of Knowledge and Learning Objects*, 1, 67-77. Retrieved November 8, 2010 from <http://ijello.org/Volume1/v1p067-077Harman.pdf>
- Jeyaraj, A., Rottman, J. W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1-23.
- Levy, Y. (2007). Comparing dropouts and persistence in e-learning courses. *Computers & Education*, 45(2), 185-204.
- PreceI, K., Eshet-Alkalai, Y., & Alberton, Y. (2008). Students' attitudes toward a new pedagogical model for a fully online course. In Y. Eshet-Alkalai, A. Caspi, & N. Geri (Eds.), *Learning in the Technological Era: Proceedings of the Chais Conference on Instructional Technologies research* (pp. 157H-164H). Raanana, Israel: The Open University of Israel. [in Hebrew] Retrieved November 8, 2010 from http://telem-pub.openu.ac.il/users/chais/2008/noon/1_1.pdf
- Rogers, E. M. (2003). *Diffusion of innovation*, 5th edition, New-York: The Free Press.
- Steimberg, Y., Guterman, E., Mermelstein, B., Brickner, R., Alberton, Y., & Sagi, R. (2010). Students' perspective on teaching and learning with video technology at the Open University of Israel. In Y. Eshet-Alkalai, A. Caspi, S. Eden, N. Geri, & Y. Yair (Eds.), *Learning in the Technological Era: Proceedings of the Chais Conference on Instructional Technologies research* (pp. 186H-194H).

Raanana, Israel: The Open University of Israel. [in Hebrew] Retrieved November 8, 2010 from http://telem-pub.openu.ac.il/users/chais/2010/after_noon/4_1.pdf

Venkatesh, V., Morris, G. M., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

Whatley, J., & Ahmad, A. (2007). Using video to record summary lectures to aid students' revision. *Interdisciplinary Journal of Knowledge and Learning Objects*, 3, 185-196. Retrieved November 8, 2010 from <http://ijklo.org/Volume3/IJKLOv3p185-196Whatley367.pdf>

Woodley, A. (2004). Conceptualizing student dropout in part-time distance education: Pathologizing the normal?. *Open Learning*, 19(1), 47-63.