

# Chapter 18

## How Video Usage Styles Affect Student Engagement? Implications for Video-Based Learning Environments

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**Abstract** There is a growing number and variety of video-based learning environments; however, the adoption and engagement with them are not always very high. This is partly due to the fact that students do not always use videos as expected. Recent studies have investigated students' engagement toward video-based environments; however, the effect of different usage styles such as platforms used, video duration, watching period, and students' experience on engagement is yet to be explored. This study investigates potential influence of video usage styles on student engagement. Data collected from 40 students who enrolled into a video-assisted course suggest that usage styles affect students' engagement to video materials. In particular, the results demonstrate that previous experience, video platform, video duration, and the watching intensity have significant effect on students' engagement. The overall outcomes are expected to promote theoretical development of students' engagement, video environments design principles, and better and more efficient use of videos, with particular focus on video lectures.

**Keywords** Video lectures · User-centered design · Usage styles · Engagement

### 18.1 Introduction

During recent years, the usage of videos for information transfer and learning purposes has increased. The number of institutions and business organizations provides their content using videos; for example, many instructors in higher edu-

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cation are implementing video lectures in a variety of ways, such as broadcasting lectures in distance education [1], delivering recordings of in-class lectures with face-to-face meetings for review purposes [2], and delivering lecture recordings before class to conserve class time and flipping the day for hands-on activities [3]. In addition, the number of for-profit organizations who use training or advertising videos is increasing rapidly.

Due to the importance of students' engagement with videos, interaction designers and instructional designers spend considerable amount of time and money on how these videos can be better provided via different platforms with different designs and affordances to the users. Drawing from the user-centered and interaction design theories [4], one of the most important questions is: *How to increase student engagement with the videos?*

As a step toward this goal and given the different video usage styles (e.g., previous experience, video platform, video duration, and the watching intensity), in this study we attempt to understand how usage styles impact student engagement. In particular, this research included questionnaires incorporating factors regarding students' engagement and questions for identifying their usage styles, and basic analytics drawn from the platform. After users employed two different video systems to assist their studies during a full semester, they were asked to complete the questionnaire based on their intensive experience.

## 18.2 Background and Hypotheses

Student engagement refers to the state of the student being involved, occupied, retained, and intrinsically interested in something [5]. In this study, engagement is based on students' post-behavior; thus, engagement consisted of users' attitudes, and intrinsic interest [5] after the intense video learning experience. Engagement is beyond the concept of acceptance or usefulness with the medium, which are considered as a subset of engagement [6]. Hence, in our study, we use both students' intention to further use (acceptance) and usefulness in order to investigate students' engagement.

Although videos for learning/training have been employed in the industry and education for many years, several factors regarding learners' engagement with and use of videos have changed. For example, learners can interact with the content in various ways, video repositories have advanced (e.g., iTunes, YouTube), and other interactive and smart video-based systems have appeared (MOOCs, Interactive TV).

Today, advanced video repository systems have seen enormous growth (e.g., [videlectures.net](http://videlectures.net), Khan Academy). Most of the 2.0 technologies such as wikis, blogs, and other social media have added video affordances. It is notable that sometimes, the same video is posted on two different platforms (e.g., YouTube and an institutional/organizational platform). With the widespread adoption of different video platforms, new research from the design and learning perspective is emerging.

Therefore, we want our research to make a first step in this direction by examining *whether the difference between a commercial and an organizational video platform affects students' engagement*.

The predictors of continued engagement for technologies would not be the same for all students; this is particularly clear in students with different experiences. For example, the level of Web site browsing experience influences the engagement with it [7]. Most of the times, experienced students react differently from novices; hence, it is natural to expect that *students' experience with videos is a significant factor of their engagement*.

Numerous comments have been made in the past regarding watching intensity. Dale and Pymm [8] have indicated the importance of rewinding, skipping, and other similar affordances to navigate video content. Although research has mentioned several different watching intensity types and navigation, the differences between the two main watching intensity types, users who watch the full video and those who watch only part of it, are yet to be explored. Hence, in our research, we want to examine *whether the watching intensity affects users' engagement*.

Another important video usage style is the preferred video's duration, since some students prefer watching long and detailed videos while others prefer watching short summary video. Although the duration of the videos is fundamental to the design of the video, its effect on engagement is yet to be explored. Video duration is of high importance, since organizations such as TEDx and Khan Academy provide short videos and summaries while other organizations and universities provide longer and detailed videos, mostly of the same duration as traditional lectures—without having any tangible fact behind this choice. Therefore, we want to examine *whether video duration affects users' engagement*.

### 18.3 Methodology

**Sampling** The methodology comprised a questionnaire conducted at the end of a full semester video experience. The responses were captured from June to July 2013, and it was clear that participation was voluntary. Forty students who had used how-to and lecture videos from two different video platforms responded, based on their longitudinal experience. Of the respondents, 87.5 % were males and 12.5 % were females, and all were aged between 20 and 23 years ( $M = 21.7$ ,  $SD = 1.12$ ), with the exception of one 25 years old. The sample consisted of university students with experience using video lectures on their syllabus (only two had no experience of video lectures). In the clarification letter accompanying the survey, after describing the purpose of our study, respondents were asked to answer the questions based on their video experience. Respondents watched an average of 4.03 videos (out of 12), with the median value being 4 video lectures and a standard deviation of 3.45. In addition, four users (10 %) did not watch a complete video, four watched only one video (10 %), and three (7.5 %) watched all 12 videos.

**Measures** The questionnaire consisted of two parts: (1) questions concerning the demographics of the sample and the video usage styles (e.g., age, gender, platforms used, preferred duration) and (2) measures of engagement (videos' usefulness and intention to use of videos). We used a 7-point Likert scale anchored from 1, 'completely disagree,' to 7, 'completely agree.'

**Statistical Analysis** We first carried out an analysis of composite reliability of each construct and dimensionality to check the validity of the scale used in the survey. To do this, Cronbach's alpha indicator was applied and we applied inter-item correlation statistics for the items of the construct. The results of the tests revealed acceptable indices ( $>0.7$ ). Following this, we evaluated the reliability of the measure. The reliability of an item was assessed by measuring its factor loading onto the underlying construct. In particular, factorial analysis with principal components and varimax rotation for the items of each variable was applied. The factor analysis identified two distinct factors (with three items/question each): (1) usefulness and (2) intention to use. The last step was to test the average variance explained (AVE); the AVE was found to be adequate because it exceeds 0.50.

We then investigated any potential relationships between the usage styles and users' engagement (USE and IU) to the videos. To explore the effect of different usage styles on USE and IU, we used independent sample t-test as this method allowed us to extract reliable results in a normally distributed, homogenous, and particularly small population.

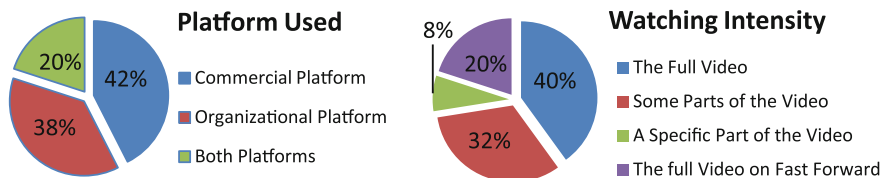
## 18.4 Research Findings

Analyzing the experience of the respondents, all of them had used videos to attain knowledge (e.g., cooking and how-to videos from YouTube) in the past six months. During the last six months, the respondents expressed that they had watched 31.48 videos as an average value with S.D. of 41.50.

Another noteworthy finding is that seventy percent of the users mentioned that videos should have been connected to a Facebook group. In addition, 17.5 % claimed that using Twitter to distribute and advertise videos would be helpful. Users also endorsed Google Plus+ (10 %), LinkedIn (10 %), etc. Hence, *the need for incorporating social media affordances in video learning platform is clear.*

Regarding the duration of the videos, students' responses varied from 15 to 100 min, with an average value at 37.41 min and S.D. at 20.01. Students' selection of video platforms was varied; the number of viewings on commercial platform (YouTube) was nearly equal to the number of viewings on the institutional organizational video platform, with a significant number of respondents using both platforms. Figure 18.1 shows students' video platform selection.

To investigate students' watching intensity, we asked them to describe how they were watching the videos. Over half of the users (60 %) were watching the full video lecture, while the remainders (40 %) were watching specific parts of the video. Figure 18.1, right, summarizes the results of the watching behavior in our study.



**Fig. 18.1** Distribution of the platforms used from students (*left*) and the watching intensity (*right*)

**Table 18.1** Testing the effect of usage styles on users’ engagement (through USE and IU)

		Mean (S.D.)		T.	Sig.
Video platform		Commercial	Institutional		
	USE	3.77 (1.31)	4.92 (1.29)	<b>2.31</b>	<b>0.029*</b>
	IU	5.16 (1.42)	5.77 (1.05)	1.25	0.221
Experience		Up to 3 videos	More than 3 videos		
	USE	3.72 (1.64)	4.97 (0.99)	<b>2.95</b>	<b>0.005*</b>
	IU	5.19 (1.56)	5.73 (1.12)	1.27	0.213
Watching intensity		The full video	Parts of the video		
	USE	4.65 (1.06)	4.04 (1.69)	1.29	0.207
	IU	5.85 (1.18)	4.94 (1.43)	<b>2.11</b>	<b>0.041*</b>
Video duration		Up to 25 min	More than 25 min		
	USE	3.94 (1.72)	4.71 (1.21)	1.64	0.110
	IU	4.39 (1.29)	5.92 (1.03)	<b>4.14</b>	<b>0.00**</b>

\*\* $p < 0.01$ ; \* $p < 0.05$

To examine any potential effect of (a) video platform type, (b) experience, (c) watching intensity, and (d) video duration, on students’ engagement, t-tests were conducted using the four independent variables (a–d) and users’ engagement (through USE and IU) as dependent.

The results exhibited in Table 18.1 demonstrate a significant effect of platform used on USE, and a nonsignificant effect on IU; a significant effect of experience on USE, and a nonsignificant effect on IU; a nonsignificant effect of watching intensity on USE, and a significant effect on their IU; and a nonsignificant effect of video duration on USE, and a significant effect on IU.

## 18.5 Discussion and Conclusions

In this research, we investigated the relationship between students’ engagement (through USE and IU) with their video usage styles. This research revealed that there are usage styles related to students’ engagement.

The study has implications for theory and practice. The findings demonstrate that users with relatively high experience in videos find them to be more useful. Therefore, it is vital to increase novices' experience; to do so, video platform developers and designers should focus *on incorporating social media and other affordances in order to attract more non-experienced users*.

Video-based environment design and development should strive to increase students' intrinsic motivations and make users feel familiar. For example, the interface and functionalities of the environment should be user-friendly by incorporating standard user-centric design principles. Hence, usability testing and intuitive design on these environments are crucial.

Another important fact that video producers and interaction designers should consider is that many times, short videos are not used consistently, resulting in lower adoption. Hence, although short videos have many uses, student engagement is many times low. Videos are ideal for reviewing and scanning through content; however, motivating users to watch the full videos increases their IU and as a consequence exhibits high engagement. Another important aspect is the possession and maintenance of institutional video environments, or at least to embed videos in an institutional Web site. This is of great importance for students, since we found that they perceive videos provided by an institutional Web site or video-based environment more useful, even when the videos are exactly the same.

Future research would valuably contribute to the understanding of students' engagement with videos. In addition, it would be interesting to see how other usage styles, such as navigation and video genres, are related to student engagement. In the next step of this ongoing project, we will deliver another video-assisted course via a video environment with detailed analytics functionality. Doing so will allow us to discover important design principles for video-environments and the development of video content; hence, we will be able to identify design and practical aspects for improving students' engagement with video learning materials.

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