

The effect of film scenarios and annotation tools on video learning

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Abstract: Streaming videos are commonly used. However, given that technology alone is not enough to improve learning effectiveness, it is important to understand what it is. In this paper, we investigated the effects of the video content style and the annotation tool on video learning outcomes and learning attitude. Results indicate that interesting stories embedded in drama-style videos could offer a meaningful context and structure for learners. However, we found that the video annotation tool did not help learners memorize the learning materials but affected their learning outcomes instead.

Keywords: video-based learning, video annotation, film scenarios

1. Introduction

Thousands of online courses are now being offered, and streaming videos are commonly considered in designing new online course materials. Video is a rich and powerful medium. It can convey the information or remembering in a interesting manner and allow the portrayal of complicated contexts (Cognition and Technology Group, 1992). Because the visually and auditorily stimulating, the use of video technology can motive learners, engage them and focus their attention on the learning material. Some empirical studies have sought to determine the effects of video instruction on learning (Choi & Johnson, 2005; Cognition and Technology Group, 1992; David, MacCracken & Reckers, 2003; Fujimoto (n.d.); Theuri, Greer & Turner, 2011; Zhang, Zhou, Briggs & Nunamaker Jr., 2006).

Video technology is suitable for active learning, problem-based learning, and situated learning, because it can help students learn in a real-world situation by being able to effectively model or demonstrate concepts or procedures in complicated contexts (Choi & Johnson, 2005). McLellan (1996) identified eight components of situated learning: story, reflection, cognitive apprenticeship, collaboration, coaching, multiple practice, articulation of learning skills, and technology. Jonassen, Peck, and Wilson (1999) suggested that stories in video can help learners easily understand and remember the content. However, many online instructional videos are lecture-style. Moreover, Mayer (2001) proposed a coherence principle for designing multimedia learning materials in 2001. This principle states that non-essential elements in learning materials (e.g. phrases, films and sounds that are irrelevant to the content) may distract learners' attention from materials that are critical to building linkages to important concepts. Eliminating such non-essential elements can contribute to higher learner concentration and better learning outcomes. One of the issues motivating this study is "Are interesting stories the 'non-essential' materials as suggested by Mayer (2001) in the instruction where they are used to present the learning materials?" In this study, we named the video that contains scenarios as drama-style video.

Besides the content within videos, the tools with video should also be considered. Many researchers have pointed out that students have better impression and concentration on a video when they are allowed to make annotations as they watch videos (such as Fu, Schaefer, Marchionini, & Mu, 2006; Masuda, Yamamoto, Ohira, & Nagao, 2008; Yamamoto, Ohira, & Nagao, 2005). Assume that interesting stories affect learner concentration on learning materials. In the context where interesting stories are used to present learning materials, if learners are asked to use an annotation tool to highlight

important points in learning materials, will they show higher concentration and better learning outcomes? This is the second issue motivating this research.

According to the research background and motivations, this study will answer three questions as follows:

1. Do students' learning outcomes and learning attitude differ depending on the use of lecture-style or drama-style instructional videos in learning?
2. Do students' learning outcomes and learning attitude differ depending on the availability of the video annotation tool in the multimedia learning system?
3. Do the style of video content and the availability of video annotation tool have an interaction effect on students' learning outcomes and learning attitude?

2. Methodology

In this study, a quasi-experimental method was adopted. Data were collected using convenience sampling from a total of eight fifth-grade classes. We divided the participants into four groups at random for four methods of instructions, including a drama-style video with the annotation tool (N=61), a lecture-style video with the annotation tool (N=65), a drama-style video without the annotation tool (N=63), and a lecture-style video without the annotation tool (N=63). In pursuit of higher reliability of the experimental results, we required all the participants to take a test of prior knowledge before the experiment. The ANOVA ($F = .238$, $p > .05$) showed no significant difference in prior knowledge among the four groups (their respective mean scores were 5.61, 5.57, 5.78, and 5.51). The experiment involved two dependent variables: (1) learning outcomes, including retention performance and transfer performance; (2) learning attitude.

3. Results

Table 1 presents the hypotheses testing results. We found that the content style of videos had a significant effect on learning retention, as students given a drama-style video ($M=3.855$) significantly outperformed those given a lecture-style one ($M=3.180$). The availability of the annotation tool in the video-based instruction had a significant effect on students' retention performance. Students who were allowed to use the annotation tool ($M=2.924$) had a significant poorer retention performance than those who were not allowed ($M=4.100$). The interaction effect between the drama-style and lecture-style videos and the annotation tool on the learning outcomes was significant (i.e., retention and transfer) but not on learning attitude. Among the four groups, the group given a lecture-style video and the annotation tool had a significantly poorer performance on retention and transfer than the other three groups.

Table 1: Hypotheses testing results.

Hypothesis	Description	Result
H1	The use of drama-style or lecture-style videos has a significant effect on learning outcomes and learning attitude.	Partially supported (The effect on learning retention was significant)
H2	The availability of the annotation tool has a significant effect on learning outcomes and learning attitude.	Partially supported (The effect on learning retention was significant)
H3	The interaction between drama-style or lecture-style videos and the annotation tool has an effect on learning outcomes and learning attitude.	Partially supported (The interaction effect on learning outcomes was observed)

4. Conclusion

The purpose of this study was to investigate the effects of the video content style and the availability of annotation tool on learning outcomes and learning attitude. Results indicate that interesting stories embedded in drama-style videos could offer a meaningful context and structure for learners to have a deeper impression and understanding of the roles, plot and content. However, we found that the video annotation tool did not help learners memorize the learning materials but affected their learning outcomes instead, as those who used the annotation tool had a significantly poorer retention performance compared to those who did not. It should be noted that when given a lecture-style video, students learned more from the teachers' direct explanation and demonstration of the learning materials; their use of the annotation tool in this learning context caused a higher cognitive load, resulting in lower learning outcomes. Therefore, we suggest teachers choose drama-style videos in the selection of instructional videos. It could induce learners' motivation and also improve their learning outcomes. However, the effect of the annotation tool in video learning should be clarified in further research.

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