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Effects of different video modalities in flipped english writing classes on students' writing scores

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Abstract

This study investigated different modalities of videos in a flipped classroom for English writing classes at a state university preparatory school. The study, a quasi-experimental design in nature, was conducted with six experimental groups and one control group (n=127). The participants' writing performance formed the study data which was collected with a writing pretest and two posttests, conceptual and essay writing posttests. The data analysis showed that the group studying "Animation with simultaneous Text and sequenced Narration in a user-paced environment" outperformed the control group having lectures in class in the conceptual posttest. The groups studying "Animation with simultaneous Narration and sequenced Text, in a whole presentation, where students studied all the parts of a video in a system-paced design, and then they answered the related questions," and "Animation with simultaneous Narration and sequenced Text in a part-by-part presentation, in which students studied each part of a video, and then they answered the related questions" outperformed the control group in the essay writing posttest. The paper provided a discussion and a set of recommendations on studying flipped classroom.

Keywords: Flipped classroom; inverted classroom; writing; language learning.

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1. Introduction

In recent years, blended learning, one of whose goals is to enhance learning gain by combining traditional face-to-face lectures with online or computer-based instruction, has been gaining popularity as “Flipped Classroom” and “Flipped Learning”. Calabro (1972) states that the learning environment should be a flexible one such as an open loft classroom (classroom without walls), and students can/should go beyond the traditional lecturing in these classrooms through individualized learning activities. Within years, this “going beyond the traditional lecturing” has been adjusted, and now, with the new advances in technology, a new type of flexible learning environments has emerged: Flipped Classroom. It has different names such as “Inverted Classroom” (Lage, Platt & Treglia; 2000), “Flipped Classroom” (Bergmann & Sams, 2007), and “Learn before Lecture” (Moravec, Williams, Aguilar-Roca & O’Dowd, 2010). In this study, the flipped design was implemented in English writing classes. The purpose of this study was two-folded: One was to measure the effect of flipped classroom in English writing classes, and the second was to investigate the effect of different modalities of multimedia representation used in those learning materials.

2. Literature Review

1.1. Flipped Classroom

In flipped design, short videos are assigned to the students so that they can watch them before coming to the class. Having watched the videos, they become ready to do some activities related to the videos. That is, the traditional “homework” becomes “school work” in a flipped learning environment. Some researchers claim that flipped learning can be based on “Bloom’s Taxonomy of Learning Domains (1956)” (Bergmann & Sams, 2012; McGivney-Burelle & Xue, 2013; Talbert, 2014; Sarawagi, 2014). In flipped learning, while the first two phases such as “Remembering” and “Understanding” occur at home, the last four high-level skills such as “Applying”, “Analyzing”, “Evaluating”, and “Creating” can be utilized during in-class activity time. In language teaching, it can be associated with the pedagogy “Present-Practice-Produce (PPP)” (Richards & Rodgers, 1986). Based on the stages of this model, “Present” stage occurs at home, and “Practice” and “Produce” stages are completed in class in a flipped learning environment.

In order to benefit from the flipped design most, instructional designers should pay attention to some important points. To illustrate, the flipped design should be used in higher education with adolescents and adults, but not in the introductory level courses (Strayer, 2012). The videos assigned as “homework” should not be too long. The optimal duration for videos is less than 15 minutes (Wan, 2014). By taking the context and the learner needs into account, when it is designed properly, flipped classes become useful, which results in more learning gain than traditional classes. In the studies done up to now (Day & Foley, 2006; Love, Hodge, Grandgenett & Swift, 2012; Talbert, 2014), the results from flipped classes have been found to be higher than or at least as high as the ones from traditional classes. However, the flipped classroom has been applied mostly in computer science, economy, science and math courses up to now (Foertsch, Moses, Strikwerda & Litzkow, 2002; Lage, Platt & Treglia, 2000; Baepler, Walker & Driessen, 2014; Strayer, 2012).

1.2. Writing

Language learning consists of four skills such as reading, listening, speaking, and writing. Reading and listening are receptive skills since learners just receive the input whereas writing and speaking are accepted to be productive skills as learners are required to produce a piece of writing or speaking by putting written words together or uttering words respectively (Obilisteanu, 2009). Moreover, according to Raimes (1983), writing involves lots of different components such as *Grammar*, *Syntax*, *Content*, *Mechanics*, *Organization*, *Word Choice*, *Purpose*, *Drafting* and *Audience*. Therefore, language learners need to practice a lot in order to become proficient in this productive skill. On the other hand, there are many different types of writing (Hedge, 2005). One of them is essay writing, which was the focused type in this study.

1.3. Multimedia Learning

According to Mayer (2005), multimedia learning is creating mental representations by presenting visual or auditory materials to learners. There are three main assumptions or theories that can be utilized while designing multimedia learning environments.

1.3.1. Dual Channel Assumption

Paivio (1978) claims that human beings have two channels to process the information presented to them. One of them is visual, and the other one is auditory channels. Pictorial input is processed in the visual channel whereas verbal input is done so in the auditory channel.

1.3.2. Cognitive Load Theory

Sweller (1988) asserts that working memory has a limited capacity; thus, processing the visual or auditory input can be overloading for it. According to Sweller (1988), there are three types of cognitive load. Intrinsic load results from the nature of the material; that is, from its default complexity whereas extraneous load is caused by inappropriate instructional design. Germane load, on the other hand, is the cognitive load emerging as a result of learning effort. Therefore, the goal of multimedia learning environment design is to remove extraneous load while triggering germane load.

1.3.3. Cognitive Theory of Multimedia Learning

Taking Sweller's Cognitive Load Theory (1988) and Paivio's Dual Channel Assumption (1978) into consideration, Mayer (2005) suggests "Cognitive Theory of Multimedia Learning" in order to make multimedia learning meaningful for learners. In his theory, Mayer (2005) suggests twelve multimedia design principles to decrease extraneous load, but to increase germane load. The principles used in this study were "Multimedia Principle" which states people learn better from words and pictures than words alone, "Redundancy Principle" that claims people learn better from graphs/pictures and narration rather than graphs/pictures, narration, and on-screen text, and "Modality Principle" that asserts that people learn better when graphs/pictures are presented with narration rather than with on-screen text.

2. Significance of the Study and Research Questions

Up to now, flipped designs have been implemented mostly in STEM (Science, Technology, Engineering, and Math) courses (Foertsch, Moses, Strikwerda & Litzkow, 2002; Lage, Platt & Treglia, 2000; Baepler, Walker & Driessen, 2014; Strayer, 2012). Moreover, as Engin (2014) argues, there is a scarcity of flipped classroom designs in language courses. On the other hand, in the flipped classroom studies so far, the traditional classroom and flipped classroom have generally been compared (Day & Foley, 2006; Love, Hodge, Grandgenett & Swift, 2012; Talbert, 2014). That is, flipped designs involving video lectures with different modalities have not been analyzed. Therefore, this study was conducted in a language course and compared both the traditional classroom with flipped classrooms and flipped classrooms with each other. In this framework, the study aimed to answer the following questions: (i) How do flipped writing classes affect the students' writing scores in English classes? (ii) Does the modality of flipped video lectures affect the writing achievement of the students?

3. Method

3.1. Design

The design of the study was quasi-experimental pretest-posttest design. The intact classes at the preparatory school were involved in the study through convenience sampling. Before the intervention, a pretest including an essay question was given to all groups, and after the intervention a conceptual posttest and an essay writing posttest were given to all groups.

3.2. Participants and Setting

The participants were 127 preparatory school students at a state university whose medium of instruction is English. There were six experimental groups, each of which studied videos including different modalities and one control group receiving lectures in a traditional classroom. At the preparatory school, seven essay types are covered throughout an academic year, and students learn how to write essays in English. The intervention was conducted in "Classification Essay" type.

3.3. Procedures and Materials

Before the intervention, a pretest including an essay question was given to all groups. The essay topic was "Types of TV programs", and the participants were asked to write a classification essay in fifty minutes. Following the pretest, six different video lectures were sent to the experimental groups. The six versions of the videos were (1) Animation with simultaneous Narration and sequenced Text (AN+T) in a user-paced environment, (2) Animation with simultaneous Text and sequenced Narration (AT+N) in a user-paced environment, (3) Animation with simultaneous Narration and sequenced Text (AN+T_W), in a whole presentation, where students watched all the parts of a video in a system-paced design, and then they answered the related questions, (4) Animation with simultaneous Narration and sequenced Text (AN+T_P) in a part-by-part presentation, in which students watched each part of a video, and then they answered the related questions, (5) Animation with simultaneous Narration and sequenced Text (AN+T_LC) in a learner controlled presentation, in which students could start watching the video from any part they wanted, (6) Animation with simultaneous Text and sequenced Narration

(AT+N_LC), in a learner controlled presentation, in which students could start watching the video from any part they wanted.

While the participants in the flipped classes studied the lecture videos at home, the traditional class students received the lecture given by their instructor in a traditional classroom setting. After the lecture parts were studied either through videos or face-to-face instruction, a conceptual test including one matching, two multiple choice, three odd-one-out, and six fill-in-the-blanks questions was given to all groups in order to see effects of the video lectures and the traditional lecture. A sample essay analysis and two categorization exercises were completed in all classes. Having enough time, the students in the flipped classes wrote a practice essay whose topic was "Types of Leisure Time Activities" in the class and took immediate verbal feedback from their instructors whereas the students in the traditional classroom wrote this practice essay at home since they didn't have enough time to write an essay in the classroom. The delayed written feedback to all of the practice essays was given by the researcher, and after all groups received their delayed written feedback, they were asked to write another classification essay whose topic was "Types of Movies" in the essay writing posttest.

3.4. Data Collection Instruments

Before the intervention, a pretest including an essay topic was given to the students. After the video intervention in experimental groups and the traditional lecture in the control group, they took the conceptual posttest (**Cronbach's alpha** =0.78) including matching, multiple choice and fill-in-the-blanks questions. Following this posttest, in-class activities were completed in each class. In the end, students were asked to write another classification essay as a posttest.

3.5. Data Analysis

The pretest and posttest essays were checked by two markers. After the normality and homogeneity of the data were checked, an ANOVA test was conducted on the pretest scores in order to check similarities of the groups. Moreover, to examine the effects of interventions on the conceptual and essay writing posttests in each group, MANOVA test was conducted after its assumptions were met in the dataset.

4. Results and Discussion

The data were homogenous and normally distributed. Based on ANOVA test results, all groups were equal in terms of the pretest scores since there was no significant difference among the groups ($F(6, 120) = 1.27, p = 0.27$). Based on the MANOVA test results, there was a significant difference in between "AT+N" ($n= 18$) and the traditional class/ control group ($n= 18$) in the conceptual posttest ($p = 0.04$). That is, when the animation and the text are presented together, and then they are followed by the narration, it helps learners recognize the target items. This intervention type doesn't comply with the "Dual Channel Assumption" and "Cognitive Load Theory" since animation and on-screen text were presented simultaneously, which loaded the visual channel. Despite this, this intervention type seems to enhance recall and recognition, so memorization and rote learning (Mayer, 2005). The reason can be consolidation of the visual input (both animation and on-screen text) through sequential narration. On the other hand, "AN+T_W" ($n = 20, M = 12.3, SD = 2.43$) and "AN+T_P" ($n = 17, M = 11.7, SD = 1.92$) groups outperformed the traditional class/control group ($n = 18, M = 9.3, SD = 2.89$) in the essay writing posttest ($p = 0.00$ and $p = 0.018$ respectively). According to these results, it can be concluded

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that when the animation and the narration are presented simultaneously; that is, the modality principle stating that people learn better when animation is simultaneously presented with narration rather than with on-screen text is applied, and then these animation and narration are followed by the on-screen text, it helps learners to transfer their knowledge in a production task. On the other hand, this intervention type may seem to be violating the redundancy principle since it presented diagram, narration, and on-screen text to the learners. However, since the on-screen text was presented sequentially in these two video lecture types in the study, the redundancy effect was eliminated. Therefore, it can be claimed that when the multimedia learning environments are designed according to the theories and assumptions (similar to “AN+T_W” and “AN+T_P” intervention types in this study), they are more likely to trigger meaningful learning (Mayer, 2005). Whether the video lecture was presented in a part-by-part or whole presentation didn't result in a significance difference in this study. That is, it can be asserted that the modality played a bigger role than the presentation type. There was no significant difference among flipped design versions.

5. Conclusion

This study was conducted in English writing classes at a preparatory school whose medium of instruction is English. It was found that the flipped classes studying AT+N, and AN+T_W, and AN+T_P videos outperformed the traditional classroom in the conceptual and essay writing posttests respectively. The study is important in terms of comparing different flipped designs including various modalities. We are currently analyzing further data which will reveal information about the covariate effect of learner autonomy, learner's critical disposition and modalities of videos on developing knowledge of writing. The further research with more participants may include eye-movement tracking in order to check how participants study the video lectures.

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