THE ROLE OF INSTRUCTIONAL VIDEOS IN PSYCHOLOGY STUDENTS’ COURSE SUCCESS

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ABSTRACT

Social presence in higher education online learning can be complex and challenging. To examine whether video instruction had an influence on course success, a between-subjects design was chosen to compare two groups of students enrolled in introductory psychology courses at a Christian College in the Southwest United States. The convenience sample (N = 281) was divided into two groups, including those that received video instruction (N = 144) and those that did not (N = 137). The results demonstrated that while there were higher numerical final course grades for the classes that received video instruction, there was not a statistically significant difference in overall course success between the two groups (U = 8947, p = .159). Implications and limitations are discussed.

Keywords: video instruction, between subjects design, online learning, higher education, Web 2.0 tools

INTRODUCTION

With over six million people enrolled in at least one online or distance learning course, higher education institutions offering online courses have an opportunity to enhance social presence in teaching (Allen, & Seaman, 2017). In addition, the Online Learning Consortium (2018) reported that between 2012 and 2015 there were 931,317 students nationwide who abandoned traditional face-to-face instruction and opted for online education. While the benefits of online education are many (e.g., course offerings, accessibility, convenience, versatility of recorded content, and adjustment to learning style), there can also be negative aspects to this form of learning (Bourdeaux, & Schoenack, 2016; Crawford-Ferre & Wiest, 2012; Li & Irby, 2008). Some negative characteristics of or barriers to online learning include a lack of support for students, poor academic skills, the rigor of accelerated classes, the cost, required technology literacy, and a lack of socialization and access to instructors (Muilenburg, & Berge, 2005). Many students who enroll in online courses are adults who work full time and have families. Unfortunately, those who do not feel supported in their learning, or run into barriers, end up frustrated and withdraw from class (Park & Choi, 2009). According to Bonvillian and Singer (2013), combining the strengths of both online and traditional, face-to-face learning formats can be beneficial but not in a “blended-learning” model but by using the strengths of both modalities to promote and support students’ learning. One way to accomplish this is through the use of video instruction/aids in the classroom to support proximity between the student and teacher and increase the social presence of the faculty member/instructor.

Setting clear expectations for students is logical for course instruction and can be particularly important for the online modality. However, students may complain about their level of understanding of course content and instruction, which can lead to increased frustration and possible withdrawal from a course. According to Sugar, Martindale, and Crawley (2007), with the increase in online education options and overall popularity of this modality, it is critical that online courses have effective online delivery methods of instruction. There is a possible misconception with online adult learners at the collegiate level that due to their
autonomous level of learning, they are not in need of assistance, direction, or support (Baran, Correia, & Thompson, 2011). Haley and Booker (2012) posit that one of the most important elements to student success in online education is the connection between the teacher and student. Due to this, McLawhon and Cutright (2012) suggest that online instructors must create opportunities to engage students and enhance not just proximity but also their social presence in online courses to support retention efforts as well as the student’s success.

**LITERATURE REVIEW**

It is already well-established in the literature that social presence in general is important to student success in the online learning environment; however, the extent to which students feel a connection to their instructor is even more integral to their success (Swan & Shih, 2005). Within the context of higher education, social presence theory can be described as “the degree to which a person is perceived as a ‘real person’ in mediated communication” (Gunawardena, 1995, p. 151). Instructors with greater social presence keep students more engaged and promote more interaction within the online classroom, thus potentially increasing the likelihood of educational success (Hostetter & Busch, 2006; Kožuh et al., 2015; Paquette, 2016). In an online learning environment, faculty do not have the convenience of relaying tone and body language to facilitate their presence in the classroom. The primary use of text-based learning that is characteristic of online learning has continued to challenge instructors and poses difficulties in establishing social presence and rapport (Kear, Chetwynd, & Jefferis, 2014). Elements of typical classroom social presence, such as eye contact, facial expression, and body language, are difficult to replace or duplicate in such an environment (Esani, 2010; Mayne & Wu, 2011). However, recent studies have indicated that there are ways to successfully implement social presence in online classrooms and in doing so, student outcomes can be subsequently improved. Such techniques include the use of individual, focused instructor-to-student discussion or small group discussion forums to help promote social presence as opposed to simply posing discussions to the class as a whole (Akcaoglu & Lee, 2016). While much of the research has focused on the applications of social presence in text-related communication, there is support for the importance of exposure to the instructor’s voice in facilitating social presence. For example, instructors have used voice-delivered content through Web 2.0 tools to help establish social presence and increase student engagement (Basko & McCabe, 2018; Borup, West, & Thomas, 2015; Cunningham, 2015). Thus, the use of instructor voice lead classroom tools plays an important role in social presence and student outcomes in the online modality.

With the demand for online higher education growing in popularity, faculty are consistently searching for effective pedagogy that fosters and enriches the classroom environment while supporting student success (Baran, et al., 2011; Basko & McCabe, 2018). Due to the predominantly asynchronous nature of online instruction, faculty have become creative in the additional elements they add to curriculum to support student learning (Conway, Easton, & Schmidt, 2005). While it is more common to use generic web-based and video/audio resources, faculty have begun to create their own videos through the use of Web 2.0 applications that are personalized to each student or class. Strategies may consist of using content related audio/video lectures or audio-enhanced PowerPoint presentations (Drouin, Hile, Vartanian & Webb, 2013; Hegeman, 2015; Reinecke & Finn, 2015). In terms of personalization, faculty sometimes deliver student feedback on assignments using video tools (Anson, 2015; Borup et al., 2015; Henderson & Phillips, 2015). However, little in the literature has explored the specific use of instructor-created, assignment-related video resources as they relate to student outcomes. Online faculty who utilize any type of additional video or audio content can only expect to see added benefits to the classroom environment and student outcomes (Borup et al., 2015).

With any learning environment, each student arrives in class with their own expectations, unique needs, and preferences for instruction. The use of multimedia can be important in optimizing online learning experiences for a diverse group of students (Oliveira-Neto, Huang & Azevedo-Melli, 2015). The introduction of video instruction and feedback can aid in any content area and potentially mitigate some of the challenges posed when diverse learnings styles converge with
asynchronous online coursework. Using either video or solely audio components in online courses extends the availability of information for all students (Allison & Rehm, 2016). By enriching the classroom with videos, students who identify with audio, visual, and even kinesthetic learning styles may find information more accessible than if the information was provided only in written format (Manner, 2005).

Regardless of learning style, students overwhelmingly report video/audio feedback as useful and easy to understand. Specifically, they find that the feedback is easier to apply to future assignments because, in following along with instructor verbal feedback, they were able to see what areas the teacher was specifically referring to (McCarthy, 2015). Most importantly, providing video aids in the online classroom has the potential to positively impact student outcomes. This effect can potentially extend to both summative and formative assessments when used as a classroom assessment technique to assess a student’s learning (DiCarlo & Cooper, 2014). According to Hegeman (2015), students tend to perform better on assignments for class when they are provided instructor-generated video resources for weekly lectures. Students are able later to apply the information to assignments as the concepts have been clarified in a way that supports their understanding (Litao, 2017). For example, in a study on content retention, Armstrong, Idriss, and Kim (2011) found that videos often assist students in retaining more information than if they read the information alone, which suggests that perhaps video instructions are more easily recalled and utilized when students are completing assignments after viewing the video. Students who view video resources tend to have higher overall final grades in class, perform better on final exams, and illustrate better educational outcomes in general (Anson, 2015; Dana & Lori, 2015; Ozan & Özarslan, 2016).

According to Drouin et al. (2013), instructors primarily use video aids when providing feedback on student work. When students receive video feedback in lieu of, or in addition to, written/text feedback, they report a preference for videos. Students tend to feel that the feedback is more individualized, supportive, and motivating (Henderson & Phillips, 2015). In addition to motivating students, Griffiths and Graham (2009) suggest that video feedback also promotes feelings of connectivity between students and their faculty and positively motivates students. This type of feedback is also perceived as more caring, constructive, and detailed (Anson, 2015; Atwater, Borup, Baker, & West, 2017; Borup et al., 2015). Students are also able to feel the instructor’s tone and presence more clearly than if feedback was delivered only via written text (Lamey, 2015). Classroom support through video instructions can not only support instructor presence, but it can also offer students specific benefits.

The integration of video resources also plays an important role in promoting student engagement, which is essential to learning regardless of content or topic (Lei, 2016). Video components have the added benefit of allowing instructors to provide specific targeted detail as well as information that might otherwise be overlooked (Sull & Cavanaugh, 2014). With such strong support indicated for the use of videos in the online classroom and in other capacities, instructor-generated videos detailing assignment instructions may be a potential strategy for promoting student success. In addition, due to the nature of asynchronous online courses, instructors often do not have the opportunity to address assignment related questions in real or live time, thus making it even more important that resources for clarification are provided in prediction of possible questions (Conway, et al., 2005). Given that students cite instructional visual resources among the top eight most helpful resources that assist with their online learning, it would be assumed that in any capacity video enhancements would impact student outcomes positively (Jayaratne & Moore, 2017). Faculty often use audio and visual enhancements in classes to provide feedback, as well as course content; however, little has been explored in the literature on the role that instructional videos play as they relate to specific assignments and overall student outcomes. This current study builds upon the existing literature by exploring whether adding video instruction to online classrooms can impact student outcomes.

STUDY PURPOSE AND RESEARCH QUESTION

Considering the body of literature examined, this study queries the possible impact that video instruction might have on students’ overall success and, specifically, whether video instruction had an impact on students’ final course grade. To investigate whether a difference between the two groups exists,
a Mann-Whitney U test was employed to answer the following question: Are there differences among groups of students’ final course grades when video instruction is introduced?

METHODS
A descriptive study with a quantitative approach using a between-subjects design was deemed appropriate in relation to the data and the research question posed. Quantitative studies have data that can be quantified within the statistical results while examining whether a relationship exists between the independent variable (Video Instruction) and the dependent variable (Final Course Grades) (Creswell, 2013). Subsequent to IRB approval, archived data was requested and obtained. The data was then cleaned, including a check for assumptions, outliers, and normality, to prepare for analysis using a Mann-Whitley-U test.

Participants
A convenience sample of students (N = 281) enrolled in online introductory psychology courses at a Southwest Christian University, the final course grades were analyzed for differences between classes that received video instruction and those that did not. A total of 12 online classes taught by two instructors were selected (six Video Classes and six Non-Video Classes). Each instructor had three sections of classes with video instruction and three classes without video instruction. While the classes were randomly selected by the university, the instructors submitted a list to the university as to which classes had video instruction and those that did not. This was important to ensure an approximately equal balance of class size. A priori through G*Power analysis was calculated in order to estimate an adequate sample size for this study. Using a t-test Means: Difference between two groups, two-tailed, effect size 0.5, α 0.05, and average power of .80, a minimum sample size calculated included 64 cases for each group of a total of N = 128. The archived data sample was more robust at N = 281.

Measures
The dependent variable (Final Course Grade) was measured through archived data. Final course grade was defined as the final earned letter grade for each student for the course. Grades were numeric and recoded as whole grades (quality points +/- were removed) for the purpose of statistical testing and analysis. For example, A- was recoded to A, B+ and B- were recoded to B, and so forth. These letter grades (A, B, C, D, F/W) were then labeled as ordinals. Students who stopped attending the course and may have received a W as opposed to a final grade of F were not distinguished from those who received an F and where coded accordingly. The independent variable (Video Instruction) was initially labeled as nominal and two columns were created for both grades and groups, where groups had values assigned (Video and Non-Video) and were later coded to scale (Video = 1; Non-Video = 2). The courses that received video instruction using Loom software (www.useloom.com) consisted of one video for each of seven topics. Each introductory psychology course included seven topics with one topic objective discussed and completed per week. The video instruction was specific to each topic’s objectives for each of the seven weeks and was utilized as a supportive and supplemental addition that guided students through the weekly objectives, including the expectations for the weekly topic and how to complete the assignment that aligned with this objective for the week. Classes that did not include video instruction still had standardized curriculum materials provided by the university. These materials included a description of the topic/concept, outlined objectives, grading rubrics when applicable, templates and outlines, journal articles and assigned readings, discussion questions that purposely aligned with the objectives leading up to the weekly assignment, assignment descriptions, and facilitated instruction. In other words, the standard curriculum and facilitation by the instructor was the same for each of the 12 sections of online classes. The only difference between the two online groups of classes was the addition of the video instruction in six out of the 12 online class sections for comparison.

Procedures
Subsequent to Internal Review Board (IRB) approval, archived data from the 12 online introductory psychology courses (six Video and six Non-Video) were selected from two faculty members’ course loads from a Southwestern Christian University. Using an Excel spreadsheet, students were labeled as case numbers 1–281 and identified only by group (Video or Non-Video). Data were further broken down by final course grade in relation to the student number assigned.
The spreadsheet included three columns (Case ID, Groups, & Final Course Grades). Groups included Video = 1 and Non-Video = 2. Grades were then recoded numerically sequentially from 4 through 0 (A = 4 through F/W = 0). The Excel spreadsheet was then transferred into SPSS software for analysis. Data was cleaned, checked for outliers, assessed for normal distribution, and organized to check for violation of assumptions. Assumptions for a Mann-Whitney U test were met.

**Data Analysis**

A Mann-Whitney U test is considered the nonparametric equivalent to the Independent Sample T-Test and was chosen to assess whether there were any group differences between two groups of students in online introductory psychology courses (Video and Non-Video). This test compared two sample means (final course grade) derived from the same sample population (students in online introductory psychology courses) and was used to assess whether the two sample means are equal (McCrum-Gardner, 2008). The assumptions were not met for t-test statistical testing, however, the assumptions for the Mann-Whitney U were met. A legacy procedure was conducted to make sure the assumptions had not been violated or that there was no missing data. These assumptions included:

1. The DV (course grades) is either ordinal or continuous.
2. The IV must include two categorical groups (Video and Non-Video).
3. The independence of observations includes that each group of participants is different for each group (12 total online courses). None of the participants were overlapping or within the same group.
4. There was normal distribution among the two groups.

The Mann-Whitney U presents as group rank versus group means, which can often be difficult to interpret; however, the shape and distribution of both groups, while not identical, appeared normal. This means that the distribution of course grade is the same across categories, and therefore the assumption of similar distribution has been met. Any offset of this distribution can be attributed to not having identical sample numbers/participants for both groups (Figure 1).

Next, data were cleaned, checked for outliers, assessed for normal distribution (using a box-plot), and organized to check for violation of assumptions. Upon completion of this process, descriptive and explorative analyses were conducted for general information (Table 1 & 2), including number of students per final course grade and median score between the two groups (Video and Non-Video Classes).

**Table 1. Frequency of grades**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Video Class</th>
<th>Non-Video Class</th>
<th>Frequency</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>64</td>
<td>53</td>
<td>117</td>
<td>41.6</td>
</tr>
<tr>
<td>B</td>
<td>25</td>
<td>23</td>
<td>48</td>
<td>17.1</td>
</tr>
<tr>
<td>C</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>16.0</td>
</tr>
<tr>
<td>D</td>
<td>12</td>
<td>16</td>
<td>28</td>
<td>10.0</td>
</tr>
<tr>
<td>F</td>
<td>18</td>
<td>25</td>
<td>43</td>
<td>15.3</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>137</td>
<td>281</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note. Both B and D grades have been rounded to the nearest 10th place.*

**Table 2. Statistics**

<table>
<thead>
<tr>
<th>Course Label</th>
<th>(M)</th>
<th>N</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>2.7292</td>
<td>144</td>
<td>1.42023</td>
</tr>
<tr>
<td>Non-Video Instruction</td>
<td>2.4599</td>
<td>137</td>
<td>1.53879</td>
</tr>
<tr>
<td>Total</td>
<td>2.5979</td>
<td>281</td>
<td>1.48271</td>
</tr>
</tbody>
</table>

*Note: M = Mean; SD = Standard Deviation; N = Number of students/participants*

The Man-Whitney U (p = .159) was greater than .05 and therefore the null hypothesis cannot be rejected. In other words, there is not a statistically significant difference in course grade between those students who received video instruction and those who did not. The Mann-Whitney U test was performed to determine whether there were differences in course grades between classes that received video instruction in comparison to those that did not. Distributions of course grades for both
video and nonvideo classes were similar as assessed by visual inspection. Median course grades were not statistically significantly different between video and nonvideo classes, $U = 8947$, $z = -1.408$, $p = .159$, when using asymptotic distribution for $U$ (Dineen & Blakesley, 1973). Median distribution was the same between both groups.

**RESULTS**

In examining the descriptive statistics conducted, Table 1 presents the distribution of grades A–F, with almost half of the sample earning a grade of A (41.6%). The remaining passing grades made up 43.1% of the sample (B–D), and 15.3% did not pass the course or withdrew before earning a grade.

When examining these two groups, more students from the Video Instruction class earned A’s ($N = 64$) versus the Non-Video class ($N = 53$) (3.8%), however, this group also had 2.5% more students enrolled into those sections of classes. The Mean (M) for The Video Instuction class was 2.7292, with a Standard Deviation (SD) of 1.42023. The Non-Video Instuction class had a M of 2.4599 and SD of 1.53879 (Table 2).

Since the assumptions of statistical testing were met for the Mann-Whitney U test, an investigation as to whether the median score between Video and Non-Video Classes was analyzed. Median engagement score for Video (3.0) and Non-Video (3.0) was not statistically significantly different ($U = 8947$, $p = .159$), but the Mann-Whitney U test assesses group rank versus group means. The Video Class had a Mean Rank of 147.36 and the Non-Video Class 134.31 (Figure 1; Table 3). This clearly demonstrates that the class that received video instruction on their assignments each week earned higher course grades than those that did not receive video instruction. Distributions of the final course grades were similar, as assessed by visual inspection. However, the distribution of the final course grades is approximately the same across the two groups and is not considered statistically significant. Due to this finding, the null hypothesis was accepted.

Post hoc power analysis for two-tailed t-test provided an effect size of $\eta^2 = 0.18$, which is less than the minimum Cohen’s D recommended effect size of .2 for a small effect (Cohen, 1988) and is not considered statistically significant. The alpha was set at 0.05 with Video Group ($N = 144$) and Non-Video Group ($N = 137$), power .80, and N2/N1 ratio = 1. Calculations included non-centrality parameter $\delta = 2.8058$, critical $t = 1.962$, and $Df = 950$. Having such a low effect, despite a power of .80, produced a group sample of 476 for both groups ($N = 952$). Based upon this calculation, there was not enough power to detect an adequate effect.

**DISCUSSION AND CONCLUSION**

As growing interest in attending school online grows in popularity, instructors are challenged with finding new and creative ways to keep their students engaged. The level of engagement may affect student success, but it could be a number of other things not entertained in this study. This study attempted to establish a foundation for online learning and social presence by examining whether adding video instruction to the online learning classroom provided enough support to increase a student’s grade. While the results did not prove to be statistically significant, the class that had video instruction appeared to have better overall course success. One possible limitation to this study was not having an exact or balanced number of participants or sample group for each course. In the future, a random stratified sample may better accommodate this. In addition, of interest but not available in the archived data requested was demographic information such as the number of courses completed, standing GPA, gender, and age. Having additional information would have allowed the researchers of this current study to infer outcomes related to these variables (e.g., females have higher GPAs than males or those above the age of 35 have higher grades than 18- to 20-year olds). Knowing more about the sample can lead research to outcomes related to other variables that could potentially mediate or moderate the current variables examined in this study. In addition, despite running a G-Power using standard effect and power statistics recommended for research in the social sciences (Cohen, 1998; Lakens, 2013), further research is needed to replicate this study, including a larger sample size in order to determine if video.

Table 3. Group of Students (Video vs. Non-Video Class)

<table>
<thead>
<tr>
<th>Ranks</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Video Class)</td>
<td>144</td>
<td>147.36</td>
<td>21220.50</td>
</tr>
<tr>
<td>2 (Non-Video Class)</td>
<td>137</td>
<td>134.31</td>
<td>18400.50</td>
</tr>
<tr>
<td>Total</td>
<td>281</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
instruction can actually determine a significant effect on course grade and be generalizable.

**FUTURE RESEARCH DIRECTION**

It is possible there are mediating variables that impact or influence the results found in this study. Future research should focus on such variables to single out whether grades are higher in video instruction courses where an emphasis was placed on social presence, or if this is simply based upon student preference and therefore no significance related to video instruction alone. Participation in the online classroom is one way to rule out if the students who receive an A are just more engaged in the classroom or if improvement was made based upon implementing video instruction. Another possible mediating variable could be student learning style. Those who tend to be visual or auditory learners would logically benefit and retain more than kinesthetic or tactile learners. Another way to approach this study is to gather information each week for each assignment and compare the grades for each assignment between students who watched the video instruction and those who did not. This could, however, present a possible conflict of interest if instructors are going back into their own classes to gather this information. Archived data would have to therefore include a weekly grade from the gradebook with a comparison to those that reported or were measured as having watched the video instructions. There is a limitation, however, in how this is documented as most video software is provided through third-party vendors and there is not a direct way to prove that a video was watched by each student. Future studies may consider having a qualitative or mixed-method design to address this issue by tracking each assignment, the videos watched, and reporting the grades. Using a stratified sample of students after random selection for participation is performed is one way to ensure an equal match of students per section. While 2.5 more students in the Video Instruction group does not appear to be a large concern, the larger the sample, the larger this percentage could be, and for this reason another method should be employed to make sure there is an equal and exact distribution of archived cases. Finally, it was not a requirement to watch the video instructions for classes that included this feature. Not only would future research need to provide a way to measure which students are watching the videos, but perhaps the rate at which the videos are watched can also be measured. Meaning, not only would researchers need to know that every student was watching the video but also whether the student believed watching the video improved their course grade. Instructors should entertain a possible incentive for watching the instruction videos in order to guarantee that the videos are watched by all students in the group. Self-reporting is an option with a survey at the end of each week asking students to submit if they watched the video instruction for the week, but a stronger case could be made for an actual metric that assesses this.
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