Student Perceptions of Instructor Made Videos with Quizzes in an Asynchronous Online Course

This manuscript has been peer-reviewed, accepted, and endorsed by the International Council of Professors of Educational Leadership (ICPEL) as a significant contribution to the scholarship and practice of school administration and K-12 education.

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The purpose of this study was to determine if graduate students enrolled in an Education Leadership program perceived the use of Instructor Made Videos (IMVs) with quizzes as a useful tool to increase student-to-instructor and student-to-content engagement in asynchronous online courses. Additionally, this study sought to determine how graduate students describe their experience in an online course that included IMVs and quizzes. A convergent (one-phase) mixed-method design was employed in which both quantitative and qualitative data were collected simultaneously using a survey embedded in the Learning Management System that included both Likert style and open ended items. Quantitative and qualitative data were analyzed simultaneously and the results were compared to determine similarities and differences between the two data sets. The quantitative and qualitative results indicated that students perceived IMVs to be an effective strategy to increase student-to-content and to a lesser degree student-to-instructor engagement. Results also revealed that participants perceived quizzes as a positive addition to IMVs that held all students accountable for viewing the complete video. Given the increase in the numbers of graduate courses offered online, this study provides evidence that using Instructor Made Videos with quizzes is an effective strategy to enhance student engagement and student learning.
The recent global pandemic created an environment where many traditionally taught college courses were quickly transitioned to online formats to allow for continued instruction when face-to-face interaction was not possible. As a result, there has been increased attention on the difficulty of delivering high-quality instruction in the fully online format. While the pandemic has caused a sudden increase in the number of college courses offered online, it is hardly a new phenomenon. In the 2016-2017 school year, 76 percent of all degree-granting institutions offered courses online, and about 50 percent of institutions offered at least one program entirely online (Xu & Xu, 2019). The number of students who participate in online learning continues to increase year after year and grew to over 6.3 million for the fall semester of 2016 (Seaman, Allen, & Seaman, 2018).

Bettinger & Loeb (2017) describe online education as a promise not realized. Despite the increased access to college courses provided by online platforms, many professors simply mirror the same techniques they use in face-to-face classes rather than investing the time and effort necessary to leverage available technology to differentiate and increase student learning. The unfortunate results of the lack of attention to effective pedagogy in online courses are adverse outcomes for students.

Studies have consistently reported that students in online courses earn lower grades and are more likely to drop out of college. In a study of over 230,000 students enrolled in over 750 courses at DeVry University, researchers found that taking an online course reduced the student grade by .44 points on a traditional four-point grading scale (Bettinger & Loeb, 2017). Additionally, dropout rates in online environments are much higher than in traditionally taught courses (Muljana & Luo, 2019). Moore and Fetzner (2009) found that dropout rates were 10 to 20 percent higher in online courses and that only 56 percent of undergraduates who participated in online programs completed their courses and graduated.

Given that much of the research in effective online instruction in higher education has been conducted at the undergraduate level, further work is needed to determine the specific impacts of instructional strategies and methods to increase student engagement with graduate students. Undergraduate programs typically include general education requirements with an eventual introduction to a broad field of study. Conversely, graduate programs emphasize the study of complex material and skill development to prepare for a specific professional field (Seligman, 2012). The additional demands of study at the graduate level require that students develop critical thinking skills to master complicated concepts specific to their field of study (Holzweiss et al., 2014). This increased complexity may also create a need for a distinct set of strategies for instructors to ensure graduate student success to master course content and to have the skills necessary to apply knowledge learned in their professional environment.

Enrollment in online courses will likely continue to increase at both the graduate and undergraduate levels because these courses provide access for students who would not otherwise be able to participate in higher education (Goodman, Melkers, & Pallais, 2016), whether it is because of remote location, professional or family demands, or health and safety issues. Therefore, it is incumbent on designers and instructors of online courses to develop innovative delivery methods that engage students and provide interactive experiences.
Related Literature

Types of Interaction in Online Learning

This study's framework is derived from the seminal work by Moore (1989), who identified three types of interactions for instructors to consider as they work towards active student engagement in online environments. The first type of interaction is student-to-student, which Moore describes as students working in small groups or interaction among individual students. The second type of interaction is student-to-instructor, which focuses on the dialogue between students and their teacher. Student-to-instructor interaction can be synchronous, such as phone or videoconferencing and chats, or asynchronous, such as correspondence, email, discussion boards, announcements, or videos. Finally, Moore describes student-to-content interaction as the process of students working directly with the subject matter to construct meaning, relate it to personal knowledge, and apply it through problem-solving. Moore’s framework is depicted in figure 1.

Figure 1

Moore’s Framework for Interaction in Online Environments

Since the publication of Moore's work, several studies have sought to identify the importance of each type of interaction to student engagement in online environments. In a 2016 study, students were asked which type of interaction they found most valuable. Students in online courses perceived student-to-instructor and student-to-content interactions to be more important for learning than student-to-student interaction. In the same study, teaching presence in an online course was also reported as very important to students (Kyei-Blankson, Ntuli, & Donnelly, 2016). Similarly, Martin & Bolliger (2018) surveyed college students and found that student-to-instructor engagement strategies were the most valued among the three categories. In particular, students noted that the posting of regular announcements or email reminders and that the inclusion of a variety of course materials were essential strategies to enhance their engagement in the course. These studies’ findings reinforce the understanding that effective online learning requires deliberately planned learning experiences where the students regularly engage with both the instructor and the content.
Instructor Made Videos as an Engagement Strategy

Increasing engagement through student interaction with instructor made videos (IMVs) has been documented as an effective online course strategy. In a study of student perceptions of online learning, King (2014) found that short videos and screencasts were tools that students found to increase instructor visibility and communicate course content. In the same study, students reported that timely feedback from the instructor was essential to their learning process. Bailey, Hendricks, & Applewhite (2015) similarly found that student engagement required materials, tasks, and activities that students found relevant. Online learners preferred the use of teaching strategies that made full use of the available technological tools, including video. When students were asked to rate online learning assessments, response to video received the highest rating across all categories. It is important to note that while video has proven to be an engaging strategy in online courses, effective learning also requires that there be a mechanism such as a quiz or accompanying assignment to provide clear and accurate feedback to the student (Abrami et al., 2011). The overarching theme of research that investigates the use of video in online courses is that students recognize video as an effective strategy. However, little research exists that specifically investigates graduate students' perceptions regarding the usefulness of instructional videos made using best practices from the literature related to student-to-content and student-to-instructor engagement.

There is ample guidance in the literature for online instructors who seek to create compelling instructional videos that are most likely to engage students. Cynthia Brame (2015), the assistant director at the Center for Teaching at Vanderbilt University, suggests that videos should be brief, instructors should use a casual and conversational style of speaking, essential ideas should be highlighted using signaling and cuing, and that videos should have an embedded learning activity. Similarly, Guo, Kim, and Rubin (2014) analyzed results from almost seven million video viewings in Massive Open Online Courses (MOOCs) and reported that the optimal length of a video in an online course is about six to nine minutes with six minutes or less preferable.

Problem Statement and Research Questions

The purpose of this mixed-method study was to determine if graduate students perceived the use of IMVs with quizzes as a useful tool to increase student-to-instructor and student-to-content engagement in asynchronous online courses. Additionally, this study sought to determine how graduate students describe their experience in an online course that included IMVs and quizzes. Finally, the researchers examined the extent to which student descriptions of their experience with IMVs supported their perceptions of student-to-instructor and student-to-content engagement.

The following research questions guided the study:
RQ1. How do students rate the effectiveness of IMVs with quizzes for understanding course content? (student-to-content engagement)
RQ2. How do students rate the effectiveness of IMVs with quizzes to increase feelings of connection to their professor? (student-to-instructor engagement)
RQ3. How do graduate students describe their experience with IMVs with quizzes in an online asynchronous course?
RQ4. How do students’ descriptions regarding their experience with IMVs and quizzes help explain their ratings of the effectiveness for understanding course content and feelings of connections to their professor?
Methodology

The methodology section of this paper begins with a description of the study's mixed-method research design, followed by a data collection subsection, which includes a description of participants, the instructors’ professional backgrounds and approaches to teaching and learning, the process for the production of the IMVs and quizzes, and a description of the instrument used to collect data. Finally, the methods used to analyze the quantitative and qualitative data are described, followed by a statement about the mixed-methods analysis.

Research Design

A mixed-method design was used to develop a deep understanding of student perception of IMVs with quizzes as accountability measures. Cresswell & Cresswell (2018) define mixed method design as an approach in which quantitative and qualitative data are collected, analyzed, and integrated to gain a deeper insight into the problem being studied than is possible with one type of data alone. Specifically, a convergent (one-phase) mixed-method design was employed in which both quantitative and qualitative data were collected and analyzed simultaneously. After analyzing quantitative and qualitative data, the results were compared to determine similarities and differences between the two data sets. This design approach is derived from Campbell and Fiske (1959), who theorized that analyzing and comparing different data types was the best method to understand a complex phenomenon.

Data Collection

Participants

Participants were post-master’s graduate students enrolled in two of the six required courses in an Educational Leadership Program for initial K12 leadership certification in Georgia during the Spring 2020 and Summer 2020 semesters. The population included three sections with 79 students in the spring of 2020 and four sections with 103 students in the summer of 2020. All students enrolled in the courses were practicing educators, with most from Georgia and a small number from nearby states. Program admission requires that students hold a valid, clear, and renewable teaching certificate. All courses in the program, including those in this study, are offered only in an online asynchronous format.

Student enrollments in the two terms were non-duplicative, i.e., students in the spring classes differed from those in the summer courses. Approximately half the students in this study were classroom teachers; the other half functioned in leadership roles such as assistant principals, instructional coaches, department chairs, and program directors. Slightly more than half reported their race/ethnicity as Caucasian, a third as Black/African American, with small numbers identifying in other categories or choosing not to self-report. Participant responses indicated that 75% were female and 25% male.

Instructors

Two instructors taught the courses in which data were gathered for this study. The instructors share
similar professional backgrounds in K-12 and higher education teaching and leadership roles, including principal, associate superintendent, superintendent, university department chair, associate vice president for academic affairs, and associate provost. These leadership experiences shaped their similar teaching philosophies and expectations for students, with a commitment to effective instructional leadership influencing how they design their online courses. The professors met weekly to ensure that IMVs were made using best practices identified in the literature and that courses were delivered in a similar style with similar expectations.

Instructor-Made Videos and Quizzes

The instructors created the IMVs with the Kaltura Video Platform (version 4.2.29), incorporated into the Learning Management System (D2L, Desire to Learn, version 20.20.5). All IMVs followed production best practices that included attention to video length, delivery in a conversational style, cueing and signaling to indicate important content, and use of accompanying quizzes. In the spring courses included in the study, there were a total of six IMVs that ranged from approximately six minutes to just over eight minutes. The summer courses included seven IMVs ranging from about six minutes to just over 20 minutes.

The required, short, graded assessments associated with each video served as a check to ensure students engaged with the IMVs (Brame, 2015). Students accessed the short, five-question accountability quizzes in one of two ways. In the spring semester courses, the quizzes were separate from the IMVs. Students watched the IMV and then opened and completed the quiz housed in the course platforms assessment feature. In the summer courses, the quizzes were embedded within the IMVs themselves. As students watched a video, it would temporarily stop, and a question would appear. Students could not proceed with the video until the question was answered. Both methods provided the students with instantaneous feedback.

Instrumentation

Survey Development

The instructors developed a 10-item survey within the Learning Management System (LMS) survey tool to assess students' perceptions about the required IMV quizzes. The instructors intended to adjust the delivery of IMV Quizzes in response to student feedback. The first eight items, Likert style questions, employed a 4-point scale ranging from 4-strongly agree, 3-agree, 2-disagree, to 1-strongly disagree. Items 9 and 10 were open-ended questions that asked respondents to provide specific examples of what they liked best about the IMVs and one or two suggestions for improving the learning experience. The instructors modified the spring survey slightly for the summer administration to account for embedding the quiz questions directly into the IMVs themselves, i.e., the spring items did not use the word "embedded" to describe quiz questions. Other than that, all items remained the same for both the spring and summer survey administrations. The survey items relevant to this research and their alignment to the research questions are provided in Table 1.
Table 1  
*Instructional Effectiveness of IMVs with Quizzes (Student Perceptions)*

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Question Description for Charts/Graphs</th>
<th>Engagement</th>
<th>Research Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Instructor-Made Videos with quizzes were an effective means of communicating important course information.</td>
<td>Communicating Information</td>
<td>Student to Content</td>
<td>RQ1</td>
</tr>
<tr>
<td>2. The videos and quizzes helped me to understand course content.</td>
<td>Understanding Content</td>
<td>Student to Content</td>
<td>RQ1</td>
</tr>
<tr>
<td>4. The quizzes held me responsible for watching the videos in their entirety.</td>
<td>Accountability</td>
<td>Student to Content</td>
<td>RQ1</td>
</tr>
<tr>
<td>6. The design of the PowerPoints used in the videos helped me to focus on the most important information.</td>
<td>Design for Focus</td>
<td>Student to Content</td>
<td>RQ1</td>
</tr>
<tr>
<td>7. The videos helped me to feel connected to my professor.</td>
<td>Instructor Connection</td>
<td>Student to Instructor</td>
<td>RQ2</td>
</tr>
<tr>
<td>9. What did you like best about the instructional videos with quizzes? Please provide one or two specific examples.</td>
<td>Liked Best</td>
<td>Student to Content and Student to Instructor</td>
<td>RQ3</td>
</tr>
<tr>
<td>10. What suggestions do you have to improve the instructional videos with quizzes? Please provide one or two specific suggestions.</td>
<td>Suggestions for Improvements</td>
<td>Student to Content and Student to Instructor</td>
<td>RQ3</td>
</tr>
</tbody>
</table>

**Data Collection**

Near the end of each semester, the instructors posted announcements on the course homepage requesting that students complete the anonymous assessment. Email notifications to the classes reminded students to complete the survey if they had not already done so, reiterating that the request was voluntary, responses were anonymous, and their feedback may be used for research.

**Data Analysis**

As required in a convergent mixed-method design, data analysis began with the simultaneous analysis of the quantitative and qualitative data followed by a mixed-method analysis that integrated the two sets of results.
Quantitative Data Analysis

The researchers’ intent for including Likert style quantitative items in the survey was to assess students’ positive and negative ratings with regard to the IMVs with quizzes as a pedagogical tool to enhance student-to-content and student-to-instructor engagement. Data from the quantitative items (4-point ordinal scale ranging from strongly agree to strongly disagree) were analyzed descriptively by examining the percentage of scores in each of the four categories. So few students responded to the disagree and strongly disagree options that these two categories were collapsed, leaving three categories: strongly agree, agree, and disagree/strongly disagree. Because the number of responses to the combined agree and strongly agree categories was high (94-99%) and to the combined disagree/strongly disagree was low (1-6%), the descriptive analysis did not probe further into differences between strongly agree and agree ratings.

Further, differences between spring and summer term data demonstrated that students’ strongly agree ratings increased for all five quantitative items. This was an expected consequence of the instructors’ commitment to continuously improve their instruction each semester based on student feedback and their assessment of the IMVs with quizzes as effective pedagogy. For these reasons, a separate analysis of spring and summer data did not seem warranted; thus, the two datasets were combined and treated as one.

Qualitative Data Analysis

The purpose of the qualitative portion of this research was to understand how graduate students described their experience with IMVs with quizzes in an online asynchronous course. Qualitative research seeks to understand “how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences” (Merriam & Tisdell, 2016, p. 6). The examination of qualitative data allowed the researchers to truly understand the student perspective in their own words.

The student perspective was gathered using two open-ended items on the perception survey described in the instrumentation section. While the open-ended items were created to seek data to answer Research Question 3, the survey items were deliberately stated in a general manner so that students could react with their honest thoughts without bias from the researchers’ anticipated themes.

A sequential process of first and second cycle coding was used to analyze student responses to the survey's open-ended questions. Saldana (2016) describes first cycle coding as the process of assigning initial codes to units of data and second cycle coding as the work with the resulting first cycle codes to develop parent themes and data patterns. First and second cycle coding were completed using NVivo 12 for Windows software.

Mixed-Method Data Analysis

An essential element of mixed method design is merging results from both the quantitative and qualitative findings. This study employed a side-by-side comparison to determine if the qualitative findings either confirmed or did not confirm the quantitative results. In the side-by-side approach, researchers first report quantitative statistical results and then discuss qualitative findings that either confirm or disconfirm the statistical results (Cresswell & Cresswell, 2018).
Results

Quantitative Data

The results are presented in the order of the two quantitative research questions. First, students' ratings of the effectiveness of IMVs with quizzes for understanding course content were examined. Next, students' ratings of the effectiveness question related to increased feelings of connection to their professor were assessed.

Research question 1: How do students rate the effectiveness of IMVs with quizzes for understanding course content?

As noted in Table 2, this research question was answered through four survey items that examined aspects of the instructional strategies for helping students understand course content. These four items reference Moore’s (1989) student-to-content engagement. See Table 2 for the number (and percentages) of responses to each question.

Table 2

RQ 1 - Student Ratings, Effectiveness of IMVs with Quizzes for Understanding Course Content

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Student-to-Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – Communicating Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2020</td>
<td>38</td>
<td>73.1</td>
<td>13</td>
<td>25.0</td>
</tr>
<tr>
<td>Summer 2020</td>
<td>66</td>
<td>89.2</td>
<td>8</td>
<td>10.0</td>
</tr>
<tr>
<td>Combined</td>
<td>104</td>
<td>82.5</td>
<td>21</td>
<td>16.7</td>
</tr>
<tr>
<td>2 – Understanding Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2020</td>
<td>32</td>
<td>61.5</td>
<td>18</td>
<td>34.6</td>
</tr>
<tr>
<td>Summer 2020</td>
<td>60</td>
<td>81.1</td>
<td>14</td>
<td>18.9</td>
</tr>
<tr>
<td>Combined</td>
<td>92</td>
<td>73.0</td>
<td>32</td>
<td>25.4</td>
</tr>
<tr>
<td>4 – Accountability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2020</td>
<td>40</td>
<td>76.9</td>
<td>10</td>
<td>19.2</td>
</tr>
<tr>
<td>Summer 2020</td>
<td>61</td>
<td>82.4</td>
<td>10</td>
<td>13.5</td>
</tr>
<tr>
<td>Combined</td>
<td>101</td>
<td>80.2</td>
<td>20</td>
<td>15.9</td>
</tr>
</tbody>
</table>
The large numbers of students who strongly agreed or agreed to the four items that addressed Research Question 1 (items 1, 2, 4, and 6) indicated that students believed the IMVs with quizzes strengthened their student-to-content engagement. The strongly-agree responses increased from spring to summer, which can be explained through slight changes in the content of IMVs. Both instructors applied student feedback from the spring term to increase the time devoted to content delivery in the IMVs for the summer term. Both delivered content that students traditionally found challenging, expounding on difficult concepts by linking their professional experiences with theories taught in the courses. Noticeably, responses to the disagree categories were substantially smaller than those in the strongly agree and agree options. Only one respondent of 126 answered strongly disagree and did so only for the accountability question. Figure 2 illustrates that trend by presenting data in three response categories rather than four by combining the disagree and strongly disagree responses.

Figure 2
RQ 1 - Students’ Ratings, Effectiveness of IMVs with Quizzes for Understanding Content
Research question 2: How do students rate the effectiveness of IMVs with quizzes to increase feelings of connection to their professor?

This question was answered through one survey item that examined aspects of the instructional strategies for helping students feel connected to their professor and reference Moore’s (1989) student-to-instructor engagement. As noted in Table 1, the one survey item was: The videos helped me to feel connected to my professor. The large numbers of students who strongly agreed or agreed to the survey item that was aligned to Research Question 2 indicated a strong connection between IMVs with quizzes and student-to-instructor engagement in both the spring and summer semesters. See Table 3 for the number (and percentages) of responses to the item.

Table 3
RQ2 - Student Ratings, Effectiveness of IMVs with Quizzes for Connections with Professor

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>7 – Connection to professor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2020</td>
<td>23</td>
<td>44.2</td>
<td>26</td>
<td>50.0</td>
</tr>
<tr>
<td>Summer 2020</td>
<td>50</td>
<td>67.6</td>
<td>22</td>
<td>29.7</td>
</tr>
<tr>
<td>Combined</td>
<td>73</td>
<td>58.4</td>
<td>48</td>
<td>38.4</td>
</tr>
</tbody>
</table>

Note. N = 182 for Spring and Summer 2020. The combined spring/summer response rate was 69% (126/182). The term response rates were 65.8% for spring (52/79) and 71.8% for summer (74/103).

Qualitative Data

Students’ anonymous responses to the open-ended items were gathered and placed in a single document without identifying the specific course or professor. Of the 126 students who completed at least portions of the survey, there were 104 responses to the open-ended item (9) "What did you like best about the three instructional videos? Please provide one or two specific examples." Forty-one of those responses were from the spring semester and 63 from the summer semester. Of the 126 students in the study, there were 96 responses to the open-ended item (10) "What suggestions do you have to improve IMVs? Please provide one or two specific examples." Of those responses, 39 were from spring and 57 from the summer semester.
Once the data were organized into a single document without identifying information, a general overview of the responses was ascertained by reading and considering the document in its entirety. In general, participants reported positive feelings about their experience watching the IMVs and taking the quizzes. Upon first reading, the researchers noted that the student responses from both spring and summer semesters were very similar in content and frequency, and for this reason, results were analyzed with the data from each semester combined into one data set.

**First Cycle Coding**

Qualitative data were coded within the NVivo 12 for Windows program using a descriptive process that assigned words or short phrases as labels to categorize data into topics (Miles, Huberman, & Saldana, 2020). Items 9 and 10 were coded separately. The five most frequent codes, number of references, and coverage percentage for survey item 9 are included in Table 4. The number of references refers to the actual number of student responses that were assigned a particular code. The coverage percentage refers to the proportion of source content that was assigned a particular code.

**Table 4**

**RQ3 - Survey Question Nine First Cycle Codes**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description from codebook</th>
<th>Number of references</th>
<th>Coverage percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course concepts</td>
<td>References to increased understanding of course concepts</td>
<td>33</td>
<td>25.57</td>
</tr>
<tr>
<td>Video length</td>
<td>References to brevity or video length</td>
<td>28</td>
<td>17.15</td>
</tr>
<tr>
<td>Quizzes</td>
<td>References to being held accountable for video viewing with quizzes</td>
<td>21</td>
<td>20.86</td>
</tr>
<tr>
<td>Connection to professor</td>
<td>References to increased feelings of connection with the professor</td>
<td>17</td>
<td>14.27</td>
</tr>
<tr>
<td>Reinforced reading</td>
<td>References to connections or reinforcement of course reading</td>
<td>16</td>
<td>14.74</td>
</tr>
</tbody>
</table>

The most frequently occurring responses included references to increased understanding of course concepts. Students also responded positively to the quizzes that accompanied the IMVs. All responses coded with “Quizzes” included a positive reaction to being required to take a quiz after video viewing. The codes for “Video Length,” “Reinforced Reading,” and “Connection to Professor” were also frequently found in student responses to item 9.

Item 10 was coded separately, and a new set of codes were developed for this data based on the content of student responses. The most frequent response to survey item 10 was that no improvements needed to be made or that the student did not have any suggestions. There is a significant drop in the number of references and coverage with the next most frequent codes. The five most frequent codes, number of references, and coverage percentage for Item 10 are included in Table 5.
Table 5
*RQ3 – Survey Question Ten First Cycle Codes*

<table>
<thead>
<tr>
<th>Code</th>
<th>Description from codebook</th>
<th>Number of references</th>
<th>Coverage percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No improvements</td>
<td>No suggestions provided or comments that no improvements were necessary</td>
<td>47</td>
<td>28.95</td>
</tr>
<tr>
<td>Technical issues</td>
<td>References to problems accessing or using video or quiz platform</td>
<td>7</td>
<td>9.26</td>
</tr>
<tr>
<td>Video length</td>
<td>Requests for longer videos</td>
<td>5</td>
<td>9.5</td>
</tr>
<tr>
<td>Add graphics</td>
<td>Requests to increase graphics or visual images in videos</td>
<td>4</td>
<td>5.65</td>
</tr>
<tr>
<td>More Videos</td>
<td>Requests for more videos within the course</td>
<td>4</td>
<td>4.96</td>
</tr>
</tbody>
</table>

Second Cycle Coding

Second cycle coding was used to group the initial codes into a smaller number of categories to connect data to the research questions for this study. NVivo 12 software was also used for the second cycle coding process. Overarching parent codes were created to correspond to “student-to-content engagement” and “student-to-instructor engagement.” First cycle codes were then examined and arranged as child codes under the parent codes. Survey items 9 and 10 were again coded separately. For survey item 10, an additional parent code titled "No Improvements" was also added. Tables 6 and 7 list parent codes, child codes (first cycle codes), number of references from the survey responses, and percentage of coverage from survey items 9 and 10.

Table 6
*RQ3 - Survey Question Nine Second Cycle Coding*

<table>
<thead>
<tr>
<th>Parent Code</th>
<th>Number of references</th>
<th>Coverage percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>student-to-content Engagement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course concepts</td>
<td>64</td>
<td>49.05</td>
</tr>
<tr>
<td>Reinforced reading</td>
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<td>Assignment completion</td>
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<td>Connection to practice</td>
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<tr>
<td>student-to-instructor Engagement</td>
<td></td>
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<tr>
<td>Connection with professor</td>
<td>17</td>
<td>14.27</td>
</tr>
</tbody>
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36
The second cycle coding of data from survey item 9 revealed that students perceived IMVs to be a useful tool to increase student-to-content engagement. Specifically, there was a high frequency of comments about IMVs clarifying course concepts, reinforcing ideas from the reading, and that their understanding increased when professors made connections of theory to practical application. Data from question nine also indicated that students felt that IMVs helped with student-to-instructor engagement, although this benefit was not as strongly indicated as student-to-content engagement. Most of the data collected from question ten indicated a high overall level of student satisfaction with IMVs, given that the most frequent comments included the idea that no improvements in the IMVs needed to be made.

**Mixed-Method**

During the final phase of data analysis, the quantitative and qualitative results were compared to determine the similarities and differences.

**Similarities**

When the results were considered at the broadest possible level, quantitative and qualitative data indicated a high level of student satisfaction and positive perception of IMVs with quizzes. This satisfaction was apparent in the quantitative data in which there was only one rating of *strongly disagree* on the five Likert style items analyzed. Similarly, over 90% of all responses to Likert-style survey items were either *agree* or *strongly agree* except for item 6 during the spring semester. The qualitative data were similarly positive, and by far, the highest number of responses on item 10 indicated that students felt there should be no changes to the IMVs.

The quantitative and qualitative results also indicated that students perceived IMVs as an effective strategy to increase student-to-content engagement. Upon examining the four survey items aligned to student-to-content engagement, only 2.9% of all responses were in the *disagree* or *strongly-disagree* category. Furthermore, results for the survey item most directly related to this construct indicated strong agreement. When responding to question 2, which asked students to rate the extent to which the IMVs helped them to understand course content, 61.5% strongly agreed in spring, and 81.1% strongly agreed in summer. The qualitative results were similar. In second cycle coding, the parent code "student-to-content engagement" had the most references and the largest
coverage percentage. In first cycle coding, mentions of improved understanding of course content were also the highest category for both numbers of references and coverage percentage.

Results also indicated that IMVs with quizzes were an effective strategy to establish student-to-instructor engagement, although this perception was not as strong as the perceived connection between the IMVs and student-to-content engagement. Only 3% of responses to survey item 7, which asked students to rate the connection between IMVs and feeling connected to their professor, were in the disagree category, and zero students strongly disagreed with the statement. Similarly, in the qualitative data, the code "connection to professor" received 17 references and had a coverage percentage of 14.27%.

Finally, both the quantitative and qualitative data indicated that students perceived quizzes as a positive addition to IMVs and appreciated that quizzes held all students accountable for viewing the complete video. In fact, in first cycle coding, the number of references and coverage percentage of positive references to quizzes was higher than the code for connection to professor.

**Differences**

Despite the high level of agreement between quantitative and qualitative data, there were some areas of difference. Quantitative results showed an increase from the spring to summer data in the number of students who strongly agreed with all five of the survey items tested in this study. There was no corresponding shift in the qualitative responses. It may be that the qualitative questions were not written in a manner specific enough to test this type of subtle shift. One of the highest categories of frequency and coverage in the qualitative data was references to video length. While there was a Likert-style question in the survey that asked about this topic, it was not included in this paper's scope. Finally, the quantitative data indicated a perception that IMVs effectively communicated course information such as announcements, whole-class responses to student questions, and tips for producing high-quality assignments, but this same theme was not reflected in the qualitative data.

**Discussion**

This study examined graduate students’ beliefs regarding the effectiveness of IMVs with quizzes as a pedagogical tool to improve their engagement in the course. The strategy exceeded expectations as determined by graduate students' ratings of student-to-content and student-to-instructor engagement and the qualitative responses to open-ended questions in which they described their experiences. This discussion begins with a confirmation of IMVs effectiveness with graduate students, particularly its usefulness for teaching content that students consistently find challenging. It concludes with a discussion of the benefits of IMVs for ameliorating the sense of disconnection common in online settings, a non-trivial matter in today’s learning environment that has been reshaped in response to the COVID pandemic.

**IMVs with Quizzes to Enhance Graduate Student-to-Content Engagement**

Before this study, both researchers used IMVs to enhance instructor presence in their online courses by delivering information and announcements instead of delivery of content. These IMVs were produced to provide timely guidance to clarify course assignments, emphasize salient points in whole-class feedback, and reinforce tips for producing high-quality work. The IMVs featured
the instructors as "talking heads" with the idea that it would improve instructor presence and help students feel more connected in the asynchronous online classes.

When this study began in the spring 2020 term, the focus of the IMVs was a mix of course information and some content with the added accountability measure (i.e., quizzes) to oblige students to watch the IMVs in their entirety. In summer 2020, the IMVs' purpose shifted with less focus on conveying course information and more on teaching complex content. This shift in video content was a natural consequence of a commitment to continuously improve instruction.

The researchers found the students' overwhelmingly positive responses to IMVs with quizzes surprising. Positive feedback related to using IMVs to introduce pedagogical variety and focus more on teaching complex content was expected. However, the researchers also anticipated dissatisfaction with using quizzes that compelled students to watch the IMVs in their entirety. The results confirmed expectations that students liked the variety that video introduced to the course (Bailey, Hendricks, & Applewhite, 2015) and appreciated the targeted instruction that helped them understand challenging leadership concepts. The surprising outcome was their support for the quizzes. Students perceived quizzes as a tool to help them learn rather than a mechanism to manipulate their behavior.

**IMVs with Quizzes to Increase the Pedagogical Variety and Teach Complex Content**

The researchers expected that students would appreciate IMVs as diversions from the extensive reading commonly found in online graduate courses. Results confirmed this expectation; indeed, the data indicated that students wanted more IMVs in their courses. Comments such as, "The videos allowed me to focus my reading assignments when my professor highlighted the most important points," and "The readings are long, and it helped me to know what my professor thought was important" were frequently found in the qualitative data.

After considering various possible explanations for the surprisingly high numbers of positive responses (strongly agree and agree) to the four student-to-content survey questions. The researchers developed a set of questions that may be addressed in future research:

1. Do students in professional preparation programs appreciate the focus on the essential content because they needed the knowledge and skills to apply immediately in their professional settings?
2. Do education leadership students appreciate the IMVs as a way to model effective instructional design that they can apply in their K12 teaching?
3. Do quizzes that are tightly aligned to IMVs create the conditions necessary for students to more easily understand complex concepts?
4. Do IMVs convey the instructor’s sense of commitment to helping their students learn?
5. Do IMVs appeal to busy students because of the straight-forward nature of the learning activity?

**IMVs with Quizzes to Secure Accountability**

The researchers were also interested in students’ responses to the inclusion of the quizzes because of a history of push-back against using them to hold graduate students accountable to read assigned materials. Indeed, when this investigation began, the intent was to use the quizzes to oblige students to watch the IMVs in their entirety. However, the data for the accountability question was
surprising. Ninety-six percent of the respondents rated the quizzes as effective tools to hold them accountable for watching the IMVs from beginning to end, and the qualitative data indicated that students valued the quizzes as tools to help them learn. One student shared their feeling about the quizzes by stating, "I liked that quizzes allowed me to see if I understood the key points, and they held me accountable with regard to focusing on the video."

Students’ positive responses to the quizzes raised questions for the researchers. Graduate students from earlier terms felt slighted by the inclusion of quizzes to compel engagement with readings, frequently writing comments on course evaluations such as, “I am a graduate student. I shouldn’t have to take a quiz to prove that I have read the assigned material.” Why did students appreciate the quiz accountability measure when associated with IMVs, but found it distasteful when quizzes were associated with reading? This question was not tested in this study but is worthy of future research.

**IMVs with Quizzes: An Effective Pedagogy to Enhance Student-to-Instructor Engagement**

The results of this study also indicated that students perceived a connection between the IMVs and feelings of connection with their instructor. It was interesting that students did not need to see their instructor to experience the feelings of connection. During the spring semester, IMVs featured the face of the instructor speaking about course information and content. However, in the summer semester, IMVs included powerpoints where the instructor could be heard but not seen. The researchers wondered if students would have preferred to see the instructors’ faces in a small corner of the screen, but no comments in the qualitative data mentioned this issue. This is an interesting finding because it differs from Guo, Kim, and Rubin (2014), who found that students wanted to see the instructor's face during the teaching episode in a large-scale MOOC. This contradiction may relate to the difference in setting. The students in this study were part of a six-course program with class sizes of about 30 students, which is a more intimate and specialized program than the typical MOOC.

It is also interesting that instructors did not establish connections with students by sharing personal information such as hobbies, pets, or interests. Instead, connections were established when instructors offered insights about their professional experiences as practicing educational leaders. In other words, students were invited into real-life school leadership experiences when instructors shared lived experiences, their passion for improving K-12 schools, and linking practice to theories, knowledge, and skills learned in the courses. In effect, the IMVs seemed to remove the "mystery" of effective leadership and instructional leadership. One student commented, "The professor connected the concepts to real-world learning by giving examples of how we would see or hear it in a real school setting. This felt personal and that there was an important reason to learn these things."

The researchers were also struck by the power of video to reduce the sense of isolation and loneliness that students often feel in an online learning environment. COVID has exacerbated these feelings, and so video may be a useful tool beyond courses that are historically delivered in an online asynchronous format. One student summed it up by stating, "The professor told us why we were doing things, and this made the learning more meaningful to me. In some of my online classes, I'm not even sure there is a human on the other side of the computer."
Implications for Practitioners

This study's results give direction to practitioners who seek to enhance student-to-content and student-to-instructor engagement in online courses. While students requested more IMVs in the qualitative feedback, the researchers deliberately used IMVs with quizzes sparingly and focused on the most difficult course concepts. While this study did not test the number of IMVs it would take to reach a saturation level for students; the researchers found it useful to use them infrequently so that the IMVs felt like a novelty or change of pace from reading.

The researchers found that students appreciated the brevity of the IMVs, but limiting them to six minutes, as suggested by Guo, Kim, & Rubin (2014), was unnecessary. The IMVs used in this study were between about six and twenty minutes, and students voiced no objection to length. Further research is necessary to determine the differences between student perception of IMVs in a large scale MOOC as studied by Guo, Kim & Rubin and student perceptions of IMVs used in a graduate program closely related to the student’s career goals.

Finally, the researchers found it very useful to embed the video into the Learning Management System so that students did not have to access an external platform with another password. The video production system used in this study also allowed the instructors to embed the quizzes directly into the IMVs. Students noted that this approach, combined with the allowance to repeat the quiz for a higher grade, made the process feel somewhat like online gaming with instantaneous feedback and immediate opportunity to improve. This perspective suggests that gamification may be an innovative delivery method in the online environment to help graduate students learn content and skills. It is an area worthy of further research.

Limitations and Future Directions

There were several limitations of this study based on the population and timeframe. This study focused exclusively on students who were enrolled in a graduate program for school leadership. Graduate students preparing for challenging roles may have been motivated to learn because of the immediate application of knowledge and skills acquisition to their professional environments. Students enrolled in different types of courses or programs may not respond similarly. Another consideration that may limit generalizability is that the study took place during the COVID-19 pandemic. Students might have been more receptive to innovative online teaching and learning strategies because they also were required to teach or lead in K-12 schools that were delivering instruction online.

This study focused on student perceptions of the usefulness of IMVs to establish connections with content and their instructors, but several other issues arose in the data that are worth study. Specifically, the researchers wonder how long IMVs can be before students respond negatively to them. Also, questions remain about the optimal number of IMVs per course. This study only asked one Likert style question to test student perception of feelings of connection to their instructor. While the qualitative data also suggested that IMVs increase student-to-instructor engagement, further studies should ask a greater variety of questions to strengthen these findings. Finally, more research is needed on pedagogies to reduce the loneliness of the online learning environment.
Conclusion

The number of graduate students who take at least some portion of their courses online has grown dramatically in recent years and will only continue to increase in the aftermath of the pandemic. As more professors are called on to transition from face-to-face to online teaching, attention must be given to the importance of effective instructional strategies that create student-to-content and student-to-instructor engagement opportunities. While instructors of graduate students can take some cues from research conducted in undergraduate settings, graduate populations and the content taught are quite different, and so more research must be pursued to understand how these students perceive their online learning experiences. Online education has been described as the promise not realized due to adverse student outcomes, but this may change when instructors move beyond using strategies that are useful when teaching in traditional face-to-face environments. IMVs with quizzes offer an effective “no waste” pedagogy that focuses students on essential learnings and key points in a manner that students find engaging.
References


