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Student Post-Pandemic Perceptions of Supplemental Instructional Videos

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Abstract

With the structural shift in education due to the pandemic, worldwide educators adapted by a variety of methods, including a change to the course delivery method. Many universities closed and/or moved to wholly online delivery. With the online video formats, either synchronous or asynchronous, faculty were able to create a library of videos which could be later used as a tool. This new collection of videos could be used for asynchronous delivery or online courses, or as supplemental instructional videos. A survey was conducted to determine student perceptions of supplemental instructional videos.

Supplemental instructional videos were available pre-pandemic by individual instructors and publishers. Instructors may have offered videos through a Learning Management System (LMS) or a streaming platform. These types of videos vary from general topic overviews to course specific content. Certain types of courses and content have long been identified as appropriate for online delivery, like software-based courses. However, instructors have been slow to adopt online delivery for hands-on laboratory exercises or architectural studios.

Because of this post-pandemic paradigm shift, there is an opportunity to identify the associated shift in student perceptions. A survey instrument was developed to assess student perceptions about supplemental instructional videos. All of the students surveyed are enrolled in courses which provide supplemental instructional videos through their LMS. The survey was not limited to perceptions about current courses. Students across engineering, engineering technology, and architecture disciplines were asked about their perceptions of supplemental instructional videos made available through LMS. The LMS collects analytical data about usage, and depending on the LMS, precisely how much and which portions of a video were viewed by students. The survey included demographic questions in addition to questions about experience with online learning and supplemental instructional videos.

Students surveyed included all levels of undergraduate students and graduate students from two universities in different states. Students are generally split in their preference for online or face-to-face delivery methods. About two-thirds of the respondents had been exposed to supplemental instructional videos. Similar to completely online courses, respondents identified reasons that supplemental instructional videos were a good resource, which included the lack of time constraints and the ability to watch and re-watch the videos.

Keywords: Supplemental Instructional Video, SIV, Pandemic, Covid-19, Course Delivery Methods, Online Delivery

Introduction

Instruction has been evolving from an in-person or face-to-face (F2F) delivery to asynchronous online. Around 2006, the move from dial-up to broadband internet has been seen in education and allows for synchronous streaming of content [1]. Shortly thereafter, hybrid and flipped classrooms appeared [2]. As Covid-19 affected in-person learning and moved most education to online, educators had the opportunity to record their lectures in the new delivery paradigm. Although educators may have responded differently, some of the streaming meeting platforms allowed lectures to proceed while being recorded. Along a similar vein, some educators have reported difficulties with providing certain types of courses online. Courses which may be difficult to deliver online include studios, capstone projects, and laboratory exercises to name a few [4].

Beyond changes due to the pandemic, there were many locations to find pre-recorded lectures. Textbook publishers may provide supplemental video content to complement hard-copy or electronic textbooks [5]. Some streaming platforms like YouTube provide opportunities for educational videos [6] and [7]. These platforms offer instructional videos covering general topic overviews to very specific college coursework. Streaming videos may be presented by instructors but are also presented by subject matter experts. Some types of videos have been found useful to students including software help, lab exercise introductions and tool use introductions [8].

Certain types of courses may lend themselves to either an online or blended delivery method. It is well-documented that computer-based classes, like programming or computer-aided design (CAD), are easily and favorably converted from traditional delivery [5], [9], and [10]. Further there is a need to determine how the videos are used. Is there lecture F2F and online? Or are videos offered only for additional information? Although there is plenty of research on best practices for instructional videos [6] and [8], this research is focused on Supplemental Instructional Videos (SIVs) since the pandemic began. Further, the instructors in this research did not collaborate on their instructional videos or delivery methods.

Background

Based on the recent structural changes to course delivery methods, it is important to determine how videos created by faculty are being utilized now that many universities are returning to F2F learning. Faculty created both synchronous and asynchronous content, with live video recordings of lectures occurring in many classes. With a significantly increased video library available to faculty, these videos can also be made available to students as Supplemental Instructional Videos (SIV). SIVs can be assigned to students, be presented in the LMS as reference material, or act as an additional external resource like YouTube videos. Participating faculty utilize SIVs in a variety of ways and surveyed their students on perception of those SIVs. This research seeks to determine student perceptions on SIVs, student use and how SIVs can be more conducive for learning.

Methodology

A 25-question survey was created to determine student perceptions of Supplemental Instruction Videos. The survey was delivered via Qualtrics. The faculty research team teaches in STEM fields. Students surveyed were typically in Architecture, Construction, Engineering or Engineering Technology type majors from two universities, Kennesaw State University and Oklahoma State University. Qualtrics was used as the survey mechanism and for distribution. Qualtrics identifies unique users via IP addresses and is able to determine if an attempt has been completed via a true/false marker. Further a consent question was included in the survey. Respondents who did not consent were sent directly to the end of the survey. The survey was distributed to over 600 students through LMS and flyers. Surveys were collected in 2021, so most students had been exposed to online course delivery during Covid-19.

The survey collected demographic information, experience with online courses and best practices in videos. The survey also collected data on videos used to supplement to the lecture format, regardless of lecture delivery method. Several questions with long answer responses were posed in order illicit a more thoughtful response from students. For long answer questions, answers were initially coded based on overall themes. In addition to the initial codes identified, the responses were further reviewed for sub-codes. Where applicable, the codes were then correlated with any demographic data.

Results

Based on the faculty giving the surveys in their courses, Architecture, Construction, Engineering or Engineering Technology, the demographics are much to be expected. Although 90 attempts were made to start the survey, 68 respondents consented and completed the survey. One respondent was removed for duplicate IP address and duplicated responses, providing a total of 67 responses. The respondents are 71.6% male, 26.9% female with one respondent self-identifying as “Agender.” Considering ethnicity, 8.9% of respondents identified as African American or Black, 4.5% American Indian or Alaska Native, 1.5% Asian, 68.6% Caucasian or white, 7.5% Hispanic, 1.5% Other, 4.5% Prefer not to State, 2.9% Two or more races. The respondents who identified as Other added Middle Eastern, and the Two or More Races identified as “Caucasian and Native American” and “Caucasian and Asian.” Respondents identified as being from Georgia (25.4%), Oklahoma (62.7%), Oregon (1.5%), or Texas (10.4%). Undergraduate respondents represented freshman (10.4%), Sophomores (35.8%), Juniors (13.4%) and Seniors (35.8%), with 4.5% Masters students. Respondents came from 9 different majors, all in STEM fields.

Of the respondents, 96% had previously taken an online course and 55% of respondents indicated they enjoyed online courses. For the question, “Were your online lectures recorded, live, or both?” 89.6% responded both, while 10.4% responded recorded only. No respondents indicated only live online lectures. However, to the following long answer question, “Based on prior response, describe which (recorded, live, or both) worked best and why?” the results indicate the question may have been misunderstood. Many respondents still indicated they preferred either, both types of lectures (43.9%), recorded (33.3%), live (22.7%) with one no

response. It is interesting because with long answer responses, it is evident that some respondents indicated “live” meant in-person rather than synchronous delivery. As one response indicates, “…the spread out distance meant I couldn't hear well in class so there was no point in going.” And another, “…Going to class in person forced me to pay attention and actually leave my room and encouraged me to make friends with people in my class. …”

When asked “What are your thoughts about online courses?”, approximately 35.8% of respondents indicated they liked online courses, while 16.4% of respondents indicated they did not. Some respondents (16.4%) felt that online classes were more flexible for students who work or need flexibility with their courses. Another 7.5% indicated that online courses were sometimes more appropriate, depending on the course, but generally felt that STEM classes were best in person. There were also respondents (22.4%) who had concerns about online delivery based on the workload or instructor and one student who did not fit into the other categories.

When asked if an instructor provided online lectures instead of in-person classes, 91% of respondents indicated yes, while the other 9% indicated no. Respondents were then asked if they had any preference to online versus in-person classes. The majority, 71.6%, indicated a preference. Those who indicated a preference (48) in response to the previous question were asked, why do you prefer either online or in person? Again, it was apparent that not all respondents either read or fully understood the question. Some respondents (35%) only restated their preference for one type of delivery method and did not respond to the “why” portion of the question. Most respondents (62.5%) indicated a preference for in-person classes, while those who prefer online (31.3%) indicated a variety of reasons for that choice. Two of the remaining respondents feel the delivery method should match the type of class, while one respondent feels that blended is the best option.

The next section was focused on Supplemental Instructional Videos (SIVs). Students were asked, “Based on the above description, have you been offered or assigned SIVs in any of your courses?” with 86.6% responding yes. The next question only opened for the previous affirmative responders and asked, “Were the SIVs available through your instructor, the textbook publisher or a third party via YouTube or another website?” Respondents indicated the instructor provided the majority of SIVs (70.1%), YouTube (9.0%), the textbook publisher (11.9%). This was a multiple response question, so some students selected more than one response while three did not respond. Affirmative respondents were then asked, “Did you watch the SIVs that were offered or assigned?” A large majority (98%) of respondents indicated that they watched the SIVs. When asked, “Did you find SIVs helpful? How?” The same percentage of students (98%) indicated the SIVs were helpful. A much broader group of responses was provided for the “How?” portion of the question. As students provided long answers, several responses were coded with more than one theme. A percentage is not an appropriate way to describe the responses. Instead, a bar chart is used, see figure 1. Eighteen students did not respond.

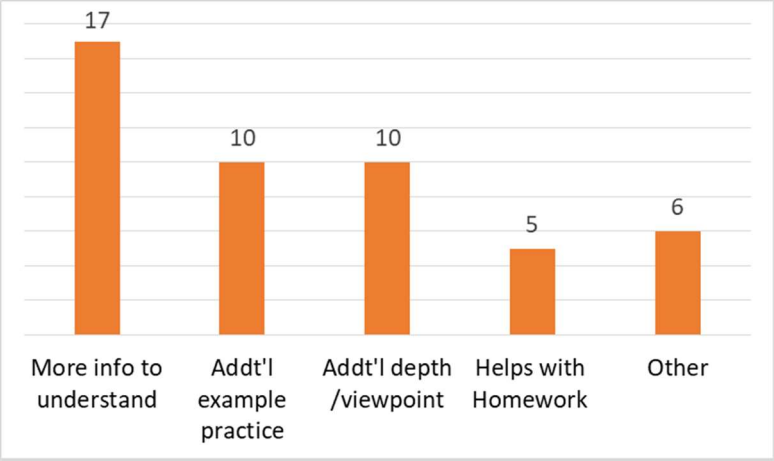

Figure 1 How are SIVs Helpful?

Types of responses that are indicative of the code "More info to understand" would be "The SIVs helped when I was confused on a certain subject but was not sure what questions to ask the professor to clarify." And "The videos explain the information a whole lot better than the book can most of the times." For the code "Additional example practice" responses included "SIVs allowed me to refresh myself on prerequisite material and also to provide greater depth to the lecture material." and "Step-by-step teaching and reviewing help me connect concepts and practice solving equations so I am familiar with working them." For "other" respondents, they indicated "They kind of helped a little bit," "The ones from 3rd party educational institutions were extremely helpful because they were straight to the point and well-edited. SIVs from instructors were no more helpful than an extended lecture." or "They can provide help at anytime, whereas an Instructor or TA may only be available to help at certain times." When considering gender, 45% of female respondents indicated the additional examples were helpful, where 17% of male respondents indicated the same. However, 73% of male respondents indicated that more information and additional depth were helpful, while 36% of female respondents indicated the same.

Only respondents who indicated SIVs were offered in their courses were asked "In the case that SIVs were optional, should they be required? Why?" Of the 58 who responded to this question, 84% felt that SIVs should be optional. Based on the response "Optional" students in general indicated that they videos may only be helpful to some students in some situations or may take unnecessary extra time. See figure 2 for the breakdown of responses. Although there were blank responses (30), many respondents indicated SIVs should be optional (20), with some students indicating the workload was too much to add additional requirements. In general, respondents indicated the additional resource should be optional stating, "They weren't always needed, they were just nice in case you didn't understand." and "If somebody already understands the course material and can do the required homework with high marks, then a few extra problems already feels like overkill." Eight respondents felt that SIVs should be required. These students felt the SIVs were beneficial with one stating, "They make sure that everyone is on the same page. If the SIV is for prerequisite content, it reminds the students what they should already be familiar with.

Making the SIV required makes sure that students are being responsible and are prepared for the content of the course."

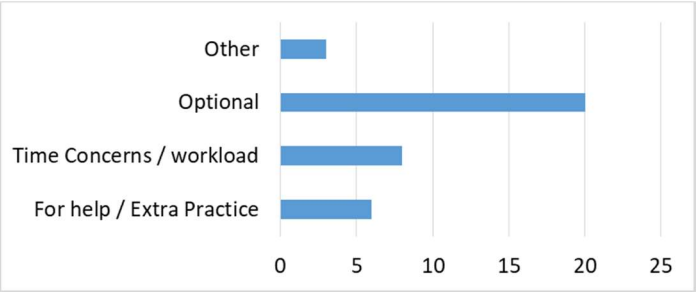

Figure 2 In the case that SIVs were optional, should they be required? Why?

The next question asked, "Is there any course (topic) where SIVs were not used, but SIV would have been helpful?," 67% of respondents indicated SIVs would be useful in additional topics. Respondents were asked to "Provide name of courses where SIVs were not used but would have been helpful." Again, as an open answer question, some respondents indicated more than one course. There were 45 students who responded, but they were allowed multiple responses. The courses respondents identified as needing SIVs are Math, Physics, and Engineering related courses. Major Specific courses vary but were also identified. See Table 1 for distribution. Further, some majors were more inclined to suggest SIVs for their courses, Architectural Engineering (7), Construction (13) and Mechanical and Aerospace Engineering (7). At least one respondent from these three majors also indicated that general engineering courses should also include SIVs.

Course Type	Count	Course Type	Count
All or Any Courses	3	Major Specific Courses	8
Chemistry	3	Math	9
Engineering	9	Physics	9
English	1	None Identified or N/A	28

Table 1 Name of Courses Where SIVs Would be Helpful

When asked, "What could be done to improve how SIVs are used to help with coursework?" respondents had several suggestions. The improvements included more specific examples or more variables (which includes examples more like homework or exam problems), making videos easy to locate by placing them near associated content and making them more readily available. This comment may be the same as "easy to locate", but accessible and available as terms were not connected to terms about other content. Table 2 details the common coded terms.

One respondent indicated "Extra credit is always a great incentive for learning." and another "Lectures should be recorded and posted unedited." These specific comments were included in the "Other" category.

Suggested Improvements	Count	Suggested Improvements	Count
Accessible / Available	8	More SIVs	4
Adjacent to Associated Content / Easy to locate	3	Optional	2
Closed Captioning	1	Well edited / Good Sound	4
Easy to Understand	1	Unsure or N/A	20
Make Short(er)	2	Other	4
More Specific / Different Variables	8	No Response	12

Table 2 Suggest Improvements for SIVs

Students were also asked "Which types of video (instructor, publisher, or YouTube) provide the best quality?" Respondents indicated the quality of SIVs was best when provided by the instructor at 68.7%, YouTube at 23.9%, the textbook publisher at 7.4%. Further a respondent commented "I think instructor SIVs are the best because I want to know what the professor thinks is important because they write the exams." Respondents were then asked if the video quality affects whether or not they choose to watch with 71.6% answering in the affirmative. For those who answered in the affirmative, they were also asked how? Table 3 provides insight into students concerns about quality, although once again, it could be argued that they either did not read or understand the question. Total video quality plus separate audio and video quality were the biggest concerns with the most succinct explanation of "If you can't see or hear information then it's not helpful." Other general responses included organization issues and rushed explanations.

Quality Concerns	Count	Quality Concerns	Count
Affects learning	22	Too general / Vague	2
Audio	8	Video	16
Clear	3	Other	7

Table 3 How does the quality of the video affect learning?

The next question was required and a long answer question, so some respondents (18) indicated "N/A" or "IDK." Respondents were asked, "What could the video producer do to help you with learning?," which allowed for multiple concepts in response to the open-ended question.

Production Ideas	Count	Production Ideas	Count
Add Captions	4	Show all steps / Explain	14
Edit for time / Be concise	6	Show clear writing / Good Visual Aids	9
Good Quality / Clear	23	Other	4

Table 4 What could the video producer do to help you with learning?

Some of the responses to previous questions included captioning, however it is interesting that respondents (4) would add captions to help with learning. Clarity (23) also was a response to multiple questions. However, it is a quite vague response when describing video quality. It is

difficult to ascertain if the respondents meant clear ideas and discussion or clear video quality. Another response to multiple questions was to show complete examples step-by-step and provide additional examples (14). Faculty handwriting and ease of viewing with adequate visual aids was also a popular response (9).

Conclusion

In general students felt their workload was heavy enough without adding supplemental videos as a requirement. These students are all in technical majors and identified the need for SIVs in Chemistry, Engineering, Math, and Physics courses. Respondents in general were positive about the availability of SIVs. Respondents also identified the need for videos to be easy to find, either in order or named by topic. The term used by the students, “accessible,” could be indicative of either ease of access or point to the need for captions as an accessible option. Accessible as a term was not well defined in the responses.

The most easily identified takeaway is that respondents would like captioning for videos with one response stating, “If it's hard to hear/not captioned things can get lost in translation and its impossible to ask for clarification.” Respondents also indicated that additional examples with complete explanations and thoroughly explained was preferred for an SIV. Respondents were also concerned about SIVs being too vague, highlighting the need for more complete information. Video quality was a concern, and within the video additional concerns were legible handwriting and good visual aids. Another concept repeated the need for “clear” videos which did not include a specific definition but was assumed to be in reference to the delivery of the video examples for easy comprehension.

Very little data within the respondent group could be correlated to the demographics provided. However, some correlations were made. More female respondents indicated additional examples were helpful while male respondents indicated additional depth and more information was helpful. Architectural Engineering, Construction, and Mechanical and Aerospace Engineering students were interested in additional SIVs in their major courses, which may speak to their specialties.

Future research into student perceptions of “clear” and “accessible” are needed. Additional research could also be performed to determine if some majors have more access or more need for SIVs as a tool in their courses.

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