

Instructor-Created Video Supplements: A Closer Look

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This study is the first to examine the demographics of students who utilize instructor-created video supplements. Using a core-level finance course, we find that students who utilize these recordings tend to be students with lower ACT Math scores and lower ACT Composite scores. A student's ACT Math score is a stronger predictor of recording utilization than the ACT Composite score. This suggests instructor-created video supplements can be especially valuable in quantitative courses. We also show that students prefer to have such supplements used in quantitative courses, as evidenced by their responses on surveys given at the end of the semester.

Instructor-created video supplements, such as podcasts, have exploded in popularity since 2003. While they are still a relatively new teaching tool, literature has started to emerge regarding the impact of these supplements. Multiple studies have found that students have a positive reaction to these supplements (Bongey, Cizadlo, and Kalnbach, 2006; Gattis, 2008; Reimers and Singleton, 2008) while other studies have examined the impact of instructor-created video supplements on academic performance (Abt and Barry, 2007; McKinney, Dyck, and Lubner, 2009; Niles and O'Neil, 2007) and attendance (Bongey, Cizadlo, and Kalnbach, 2006; Reimers and Singleton, 2008). However, there are still several aspects of these supplements that have not been addressed in the literature. This paper takes a closer look at instructor-created video supplements by filling three distinct voids in the literature.

First, to our knowledge, this study is the first to examine the characteristics of students who view instructor-created video supplements. This has significant implications regarding the way instructors use supplemental video presentations. For instance, understanding the characteristics of students who utilize instructor-created video supplements can alert instructors to situations where such tools would be especially beneficial. By the same token, understanding the characteristics of students who do not benefit from video supplements can make the instructor cognizant of instances where creating, editing, and posting video recordings may not be the most efficient use of the instructor's time. Our study finds that students who view the supplemental video recordings tend to be students with lower ACT Math and ACT Composite scores. However, we find that a student's ACT Math score is a stronger predictor of video use than a student's ACT Composite score, even when controlling for other factors, such as grade point average and effort. This suggests that instructor-created video supplements can be a powerful learning aid for students with weak quantitative skills who may struggle in a quantitative course. Therefore, we believe that using instructor-created video supplements can have positive benefits in other core-level quantitative classes which have students of diverse quantitative backgrounds, such as introductory-level Statistics, or Calculus courses.

Secondly, this paper is the first to document the use of instructor-created video supplements in a face-to-face core-level quantitative course. While Devaney (2009) uses video supplements in an online core-level quantitative course, we believe that using them in a face-to-face course is a much more common application, since the majority of college classes are still taken in a traditional classroom setting. In addition, we also make the distinction between quantitative courses at the major level and quantitative courses at the core level. Most students in a major-level quantitative course are those with strong quantitative skills. Students in a core-level quantitative course are generally less homogenous in terms of quantitative abilities than those in a major-level course. Teaching a core-level quantitative course presents a unique challenge to an instructor because the instructor must teach in a way that keeps the students with strong quantitative skills engaged while making sure that students without strong quantitative skills are able to keep up with the material. Our findings not only have implications for those who teach core-level

quantitative courses in business, such as Financial Accounting and Financial Management, but also non-business courses such as Chemistry and Physics.

Lastly, this is the first paper to survey business students regarding the areas in which they would like to see video supplements used. This study examines the results of end-of-semester surveys given to students regarding their use of the supplemental videos. Over 72% of the students surveyed strongly agreed that the recordings were helpful and another 80% strongly agreed that they would recommend the recordings to a friend. Interestingly, while only 45% of students strongly agreed that they would like to see recordings in all of their other courses, 85% strongly agreed that they would like to see recordings in all of their math-based courses. Our results indicate that student demand for video supplements is highest in quantitative courses. Furthermore, students were asked to list courses where they would like to see video supplements used. Nearly all of the courses that students listed were core-level quantitative courses.

In this study, we are careful to distinguish between instructor-created video supplements and those video supplements that are provided by textbook publishers because we believe that both are very different. Students often complain about the lack of continuity between a textbook's homework questions, homework solutions, and video guides, since all three are usually created by different individuals. In addition, textbook video supplements are likely to teach a concept in a different manner than the course instructor, which can often augment student confusion. By using video supplements that are created by the course instructor, student confusion will be minimized due to the continuity between the in-class lectures given by the instructor and the video supplements.

The remainder of this paper is organized as follows: Section 2 presents a background and literature review of topics related to this study, Section 3 describes the data used in this study, Section 4 summarizes the univariate and multivariate results, and Section 5 concludes the study.

BACKGROUND AND LITERATURE REVIEW

Video Supplements in Qualitative Courses

Most of the literature regarding instructor-created video supplements, such as podcasts, examines their use in a campus-based qualitative course. Generally, podcasts are used to record class lectures so that students can listen to, and view the lectures at their leisure. One instance of using podcasts in a traditional campus-based course is covered in Abt and Barry (2007) where the authors analyze the difference in student learning with podcasts versus written transcripts. The authors find that there is little added benefit to teaching using podcasts versus written text, based on student scores on a multiple-choice exam.

Contrary to Abt and Barry (2007), McKinney et al. (2009) find that podcasts can be beneficial to student exam scores. Similar to Abt and Barry (2007), McKinney et al. used podcasts to record lectures for students in a campus-based qualitative course. They divided students into two groups: one group listened to recorded podcasts and the other group listened to a live lecture. The authors discovered that the students who listened to the podcast while taking notes scored higher than the students who were taught in person.

While the results of the study from McKinney, et al. (2009) offers evidence that podcasts can improve student learning, many instructors are hesitant to record lectures and post them online out of fear that classroom attendance will decline. Bongey, et al. (2006) analyze the impact of having podcasts available to students in a qualitative course. The authors find that student attendance did not decline when the podcasts were introduced. Furthermore, the students indicated that they preferred the classroom lectures to the podcasts lectures and that they used the podcasts as a supplement to the classroom lectures rather than a substitute.

Video Supplements in Quantitative Courses

While many studies have been conducted regarding the effectiveness of instructor-created video supplements, most of the studies analyze their use in qualitative courses. A relatively smaller number of

studies have been performed regarding the effectiveness of instructor-created video supplements in quantitative courses.

One study which examines the effectiveness of instructor-created video supplements in a quantitative course is DeVaney (2009). This study examines the impact of introducing video tutorials in an online-based graduate level statistics course. Based on student survey results, it appears that the video tutorials were effective in aiding student learning. However, this study does not examine the characteristics of students who used tutorials versus those who do not. Similar to Abt and Barry (2007), DeVaney (2009) finds that there is no difference in academic performance between students who used the tutorials versus those who did not. Niles and O'Neill (2007) used video tutorials for topics covered in multiple business courses, such as time value of money, and regression analysis. Unlike DeVaney (2009), Niles and O'Neill (2007) found that students scored higher on quizzes taken after the tutorials relative to the scores on quizzes taken before the tutorials.

While several studies examine the impact of integrating technology such as PowerPoint or portfolio simulations in the finance classroom (Abt, and Barry, 2009; Baker, Kent, Mukherjee, and Obannes, 2009; Cudd, Tanner, and Lipscomb, 2004; Dolvin, Morgan, and Pyles, 2004; King and Jennings, 2004), few studies have examined the role of instructor-created video supplements in the finance classroom. Gattis (2008) analyzes the role of using podcasts as a supplement to a derivatives course. This study gauged the effectiveness of these podcasts using student surveys. Similar to Bongey, et al. (2006) and DeVaney (2009), Gattis (2008) finds that students' reactions to the podcasts are very positive. Our study differs from Gattis (2008) in two important ways. First, our study examines the use of video supplements in a core-level finance course, whereas Gattis (2008) explores the use of video supplements in a major-level finance course. This is an important distinction because students in an introductory level finance course tend to have a more diverse set of quantitative abilities. Secondly, we examine the characteristics of students who utilize the supplemental videos while Gattis (2008) does not.

In addition to Gattis (2008), Reimers and Singleton (2008) also examine the impact of video supplements in the finance classroom. Reimers and Singleton (2008) recorded class lectures for two different graduate-level finance courses. Based on student survey results, the authors find that students had a positive reaction to the videos. Similar to Bongey, et al. (2006), Reimers and Singleton (2008) find that student attendance was unaffected by having the lectures available online. Our research differs from the Reimers and Singleton (2008) study in that we use video recordings of problems, and not lectures. In addition, Reimers and Singleton (2008) do not examine the characteristics of students who utilize instructor-created video supplements.

Data

The data for this study was collected from students enrolled in core-level Business Financial Management course during the Fall 2010 (two sections), Spring 2011, and Summer 2011 semesters. Student-specific data, such as gender, major, ACT scores, and Elluminate usage, were collected during the Fall 2010 (two sections) and Spring 2011 semesters while survey information was collected at the end of the semester during the Spring 2011 and Summer 2011 semesters.

The instructor of the course created video solutions using Elluminate software for 40 of the most difficult homework problems assigned during the semester. Homework was assigned from the textbook used in class, which was the Sixth Edition of *Essentials of Corporate Finance*. Using this software allowed the instructor to first enter a problem on the screen (Figure 1, Panel A). Next, the instructor could annotate the problem while verbally explaining to the student the important facts in the problem (Figure 1, Panel B). Lastly, after the problem was typed and annotated, the instructor could write out the solution and explain the solution as it was being written (Figure 1, Panel C). Essentially, these recordings allow an instructor to explain a problem the same way he or she would in a traditional classroom setting. These recordings were kept short, with the longest recording lasting only 12 minutes and 34 seconds. The average recording length was 4 minutes and 22 seconds while the median length was 3 minutes and 47 seconds.

Figure 1: Example of a Problem Typed in Elluminate

Panel A is a print-screen showing how a problem can be typed in Elluminate. Panel B contains a print-screen showing how a problem that has been typed in Elluminate can be annotated in order to get students in the habit of reading problems actively. Panel C is a print-screen showing how a problem can be solved in Elluminate after the problem has been typed and annotated.

Panel A

E-Eyes.com has a new issue of preferred stock it calls 20/20 preferred. The stock will pay a \$20 dividend per year, but the first dividend will not be paid until 20 years from today. If you require an 8 percent return on this stock, how much should you pay today?

Panel B

E-Eyes.com has a new issue of preferred stock it calls 20/20 preferred. The stock will pay a \$20 dividend per year, but the first dividend will not be paid until 20 years from today. If you require an 8 percent return on this stock, how much should you pay today?

Panel C

E-Eyes.com has a new issue of preferred stock it calls 20/20 preferred. The stock will pay a \$20 dividend per year, but the first dividend will not be paid until 20 years from today. If you require an 8 percent return on this stock, how much should you pay today?

$$D_0 = 0$$

$$D_1 - D_9 = 0$$

$$D_{20} = 20$$

$$P_{19} = \frac{D_{20}}{r - g} \Rightarrow P_{19} = \frac{20}{.08 - 0} = 250$$

$$C_0 = 0 \quad F_0 = 18$$

$$C_{02} = 250 \quad F_{02} = 1$$

$$I = 8 \quad CPT NPV = 57.93$$

Similar to Klassen and Biktimirov (2007), WebCT was used to collect student data. A link to each Elluminate recording was posted in WebCT, which allowed information regarding the frequency and duration of the recording views to be collected. In order to determine whether or not a student viewed an Elluminate recording, the amount of time the student spent viewing the recording was compared to the

actual length of the recording. If the student viewed the recording for at least half of the recording's duration, the activity was recorded as a view. Students were shown one of the videos in class so that they could get an understanding of what the recordings contained and how to access the recordings.

Other data includes each student's Composite ACT score, Math ACT score, and GPA which were obtained from the university, while each student's major was obtained from the student at the beginning of the semester. Students with missing data are excluded from our analysis. In order to measure a student's effort, his or her homework score for the semester was collected. During the semester, there were 12 homework assignments worth five points each. The homework was graded on completeness, not accuracy. As a result, the students' homework scores are used as a measure of effort in the course.

RESULTS

Univariate Results - Student Perceptions

At the end of the Spring 2011 and Summer 2011 semesters, students were given an optional survey on the last full day of class regarding their perceived usefulness of the Elluminate recordings. Each student who completed the survey was asked to answer the first two questions in Panel A of Table 1. As shown in Panel A, approximately 49% of students indicated that they had a major in finance or accounting, while approximately 82% of students indicated that they viewed at least one of the Elluminate links during the semester. The 82% (40 total students) who indicated that they viewed at least one link were asked to respond to the six statements in Panel B. As shown in Panel B, 90% of students agreed or strongly agreed with the statement "I would recommend using the Elluminate links to other students." On a scale of one (strongly disagree) to five (strongly agree), the average student response for this question was 4.65. This suggests that the majority of students who viewed the links had a positive experience using them. This is also evident in the students' response to Statement 2 of Panel B. 92.5% of students indicated that they agreed or strongly agreed with the Statement 2 in Panel B, which was "I found the Elluminate links helpful."

The students' responses revealed that they believe using Elluminate would be helpful in other class settings, but is best suited for quantitative-based classes. Only 65% indicated that they agreed or strongly agreed with the statement "I would like to see other professors use video recordings similar to the Elluminate links for all of my other classes." Furthermore, 67.5% of the students agreed or strongly agreed with the statement "I would like to see other professors use video recordings similar to the Elluminate links for all introductory courses." On the other hand, 92.5% of students indicated they agreed or strongly agreed with the statement "I would like to see other professors use video recordings similar to the Elluminate links for all math-based courses." These results suggest that students value these recordings more in quantitative courses than they do in qualitative courses.

Students were also asked to respond to the statement "using the Elluminate links improved my grade in this course." 70% of students agreed or strongly agreed with this statement. However, 27.5% of students provided a neutral response to this statement. Thus, it only appears that there is moderate evidence that the Elluminate links improved students' perceived performance. One possible reason for the relatively weaker positive response rate to this statement is the students' frequency of using the links during the semester. For instance, if a student only viewed one or two links during the semester, then the student will only have increased their knowledge in one or two concepts. Since there are so many different concepts covered a core-level Business Financial Management course, only covering one or two of those concepts in more detail with Elluminate would only marginally increase the student's grade over the course of the entire semester. Therefore, it is possible that the relatively low positive response rate to the statement regarding a student's grade may be attributable to the low number of links a student viewed, and not necessarily a reflection of the ineffectiveness of the links themselves.

Students who viewed at least one Elluminate recording during the semester were also asked to "please list other courses you would like to see video recordings similar to Elluminate used to supplement the course." The responses are shown in Panel C of Table 1. The most frequent answer to this statement was Accounting. It should be noted that Managerial Accounting and Financial Accounting were both grouped

together as Accounting. The second most frequent response was Math / Calculus. Nearly two-thirds of the responses to this statement were Accounting, Math, or Calculus, while 7 students responded to the statement with Statistics. The other student responses to the statement were Economics, Derivatives, and Operations Management. Not every student who viewed the Elluminate recordings provided a response to this statement, and some students provided multiple responses. Therefore, the responses to this statement do not add up to 40, which is the number of students who viewed at least one Elluminate link.

Students who did not view at least one Elluminate recording during the semester were asked “If you did not view any of the links, why did you choose not to view the links?” Of the nine students who indicated that they did not view any links during the semester, four students responded “I used the solutions manual.” The solutions to the homework problems were posted in WebCT to allow students to check their answers and also to allow students to see how to work each problem, but without the benefit of a verbal step-by-step explanation. Two other students indicated that “I didn’t need them.” It is very likely that these students did not need the Elluminate links because they were able to understand the explanation given in the solutions manual. Based on the first two responses, it appears that the majority of students who did not use the Elluminate links had stronger quantitative skills since they were able to solve the homework problems without the verbal and visual step-by-step explanation provided by the Elluminate recordings.

There were three other answers to the question “If you did not view any of the links, why did you choose not to view the links?” One student indicated “I went to SI.” SI is an abbreviation for Supplemental Instruction, which is a program where a graduate student holds review sessions twice per week and students can come and ask questions regarding the topics that they are learning in their courses. Another student responded “Friends help with questions;” while one self-aware student declared “I am lazy.”

Table 1: Survey Results

This table displays the results of student surveys given at the end of the Spring 2011 and Summer 2011 semesters for a Business Financial Management course. These optional surveys were given on the last full day of class. The questions in Panel A were addressed to all students taking the survey. Students who indicated that they had viewed at least one Elluminate recording were asked to respond to the statements in Panel B, and they were asked to respond to Statement 2 in Panel C. If a student indicated that he or she had not viewed any of the Elluminate recordings, that student was asked to answer Question 1 in Panel C. The values in Panels A and B reveal the percentage of students answering each question, while the values in Panel C reveal the frequency of student response.

Panel A: Questions for All Students		
Questions: (Number of total students: 49)	Yes	No
1. Are you an accounting or finance major?	48.98%	51.02%
2. Did you view any of the Elluminate links this semester?	81.63%	18.37%

Panel B: Questions for Students who used Elluminate						
	1	2	3	4	5	
Questions:	Strongly Disagree				Strongly Agree	Average (N = 40)
1. I would recommend using the Elluminate links to other students.	2.50	0.00	7.50	10.00	80.00	4.65
2. I found the Elluminate links helpful.	2.50	0.00	5.00	20.00	72.50	4.60
3. I would like to see other professors use video recordings similar to the Elluminate links for all of my other classes.	0.00	2.50	32.50	20.00	45.00	4.08
4. I would like to see other professors use video recordings similar to the Elluminate links for all math-based courses.	2.50	2.50	2.50	7.50	85.00	4.70
5. I would like to see other professors use video recordings similar to the Elluminate links for all introductory courses.	0.00	7.50	25.00	35.00	32.50	3.93
6. Using the Elluminate links improved my grade in this course.	2.50	0.00	27.50	37.50	32.50	3.98

Panel C: Open Response Survey Questions		
Questions / Statements:	Response	Frequency
1. If you did not view any of the links, why did you choose not to view the links?	I used the solutions manual	4
	I didn't need them	2
	I went to SI	1
	Friends help with questions	1
	I am lazy	1
2. Please list other courses you would like to see video recordings similar to Elluminate used to supplement the course.	Accounting	12
	Math / Calculus	11
	Statistics	7
	Economics	2
	Derivatives	1
	Operations Management	1

Univariate Results - Student Use of Supplements

Panel A of Table 2 presents summary statistics for the student data. As shown in Panel A, approximately 26% of the 102 students analyzed are female, and roughly 49% of the students have a major in finance or accounting. The average ACT Math (ACT Composite) score is 22.95 (22.25), while the average GPA is 2.92. The average number of Elluminate recordings viewed by a student is 7.73, while the median is 2.00. This suggests that there is a strong right-skew to the data. The maximum number of Elluminate recordings viewed by a single student is 106. While there are only 40 different recordings produced for the course, there is no limit to the number of times a student can view each link. Therefore, the student who viewed 106 total recordings likely viewed each recording multiple times. During the semester, there were eight quizzes, three in-class exams, and a final exam, which likely contributed to the high number of total views for this student. The student's homework average score was 51.76 out of a possible 60 points.

Panel B of Table 2 divides students into two groups based on whether or not the student viewed at least one of the Elluminate recordings during the semester. While 32.4% of the students who viewed at least one link were female, only 14.7% of students who did not view any of the links were female. This difference is statistically significant at the 10% level. The proportion of accounting or finance majors was the exact same for both groups.

In addition, students who did not view at least one Elluminate link had an ACT Math score 2.77 points higher than those students who did view at least one link. By the same token, students who did not view at least one link had an ACT Composite score that was 1.43 points higher than those who viewed at least one link. There was no significant difference in GPA or effort between the two groups. Based on the results in Panel B, it appears that students who view these recordings are not necessarily weaker students (based on GPA), but rather, they tend to be students with a lower natural abilities (based on ACT Math and Composite scores).

While the results in Panel B show that both ACT Math and ACT Composite scores are significantly and inversely related, the difference in ACT Math scores is much higher than the difference in ACT Composite scores. In fact, the difference in ACT Math scores is nearly twice as high as the difference in ACT Composite scores. Furthermore, the difference in ACT Composite scores is significant at the five percent level, while the difference in ACT Math scores is significant at the one percent level. These differences are explored further in the next section.

Table 2: Student Usage Information

Panel A of this table displays the summary statistics for all student characteristics while Panel B of this table displays student characteristics for students based on whether or not they viewed at least one Elluminate video during the semester. The p-values reported in Panel B are the p-values associated with the t-test to determine whether or not the means are different for students who viewed at least one Elluminate link and those students who did not. For both panels, FEMALE is a binary variable equal to one if the student is a female, zero otherwise. QUANT is a binary variable equal to one if the student has

a major in accounting or finance at the beginning of the semester, zero otherwise. ACT_MATH (ACT_COMP) represents a student's ACT Math (ACT Composite) score. GPA represents a student's grade point average at the beginning of the semester. TOTAL_VIEWS represents the number of total Elluminate links viewed by a student during the semester. EFFORT represents a student's homework grade for the semester. All student usage information was gathered during the Fall 2010 (two sections) and Spring 2011 (one section) semesters for students enrolled in a Business Financial Management course. WebCT. Significance is noted by one (10%), two (5%), or three (1%) stars.

Panel A: Summary Statistics							
Variable	N	Median	Mean	Maximum	Minimum	Std.Dev.	Sum
FEMALE	102	0.00	0.26	1.00	0.00	-	27
QUANT	102	0.00	0.49	1.00	0.00	-	48
ACT_MATH	102	23.00	22.95	33.00	14.00	3.85	-
ACT_COMP	102	22.00	22.25	30.00	15.00	2.89	-
GPA	102	2.89	2.92	3.90	1.27	0.49	-
TOTAL_VIEWS	102	2.00	7.73	106.00	0.00	15.08	-
EFFORT	102	55.00	51.76	60.00	7.50	10.28	-

Panel B: T-Tests - Students who viewed at least one link and those who did not				
Variable	Means		Differences in Means	
	Viewed at least one video (n = 68)	Did not view one video (n = 34)	Difference	p-value
FEMALE	0.324	0.147	0.176	0.058*
QUANT	0.471	0.471	0.000	1.000
ACT_MATH	22.029	24.794	-2.765	0.001***
ACT_COMP	21.779	23.206	-1.427	0.043**
GPA	2.945	2.856	0.089	0.392
EFFORT	52.500	50.294	2.206	0.381

Multivariate Results

While the univariate results of the previous section found that ACT Math and ACT Composite scores were negatively related to the probability a student will view an instructor-created video supplement, this section investigates factors which predict video supplement use in a multivariate setting. Table 3 shows the results of a logistic regression where the dependent variable in each model is a binary variable equal to one if a student viewed at least one video, and zero otherwise. Due to the high correlation between a student's ACT Math score and ACT Composite score, Model 1 controls for a student's ACT Math score while Model 2 controls for a student's ACT Composite score. In addition, similar to Damianov, et al. (2009), Terry (2002), and Wilson (2003), both Models 1 and 2 control for each student's major, gender, and grade point average. Models 1 and 2 also control for effort, which has been shown by Cheo (2003) to be a variable which can have an impact of student achievement.

While Panel B of Table 2 show that a significantly greater portion of students who viewed the videos were female, this variable is not significant in either of the two models in Table 3. Furthermore, a student's major, effort, and grade point average are not significant predictors of video usage in either model. However, similar to Panel B of Table 2, both ACT Math and ACT Composite scores are significantly and inversely related to whether or not a student views at least one video.

Similar to Panel B of Table 2, Table 3 shows that a student's ACT Math score is a stronger predictor of video usage than ACT Composite score. ACT Math score has a coefficient of - 0.216, which suggests that the probability that a student views at least one Elluminate recording decreases by a factor of 0.81 for each one-point increase in a student's ACT Math score. On the other hand, ACT Composite has a coefficient of - 0.179, which suggests that the odds that a student views at least one Elluminate recording decreases by a factor of 0.84 for each one point increase in a student's ACT Composite score. Furthermore, the coefficient for ACT Math is significant at the one percent level, while the coefficient for ACT Composite is only significant at the five percent level. Lastly, the Pseudo R² for Model 1 (12.7%) is higher than the Pseudo R² for Model 2 (7.7%), which suggests that a student's ACT Math score does a

better job of predicting whether or not a student views at least one Elluminate recording relative the ACT Composite score.

Table 3: Logistic Regression Results – Student Usage

This table contains the results of logistic regressions used to explain the characteristics of students who viewed the Elluminate videos during the semester. For both models, the dependent variable is a binary variable equal to one if a student viewed at least one Elluminate video during the semester, zero otherwise. FEMALE is a binary variable equal to one if the student is a female, zero otherwise. QUANT is a binary variable equal to one if the student has a major in accounting or finance at the beginning of the semester, zero otherwise. ACT_MATH (ACT_COMP) represents a student's ACT Math (ACT Composite) score. GPA represents a student's grade point average at the beginning of the semester. EFFORT represents a student's homework grade for the semester. All student usage information was gathered during the Fall 2010 (two sections) and Spring 2011 (one section) semesters for students enrolled in a Business Financial Management course. Significance is noted by one (10%), two (5%), or three (1%) stars.

Variable	Model	
	1	2
INTERCEPT	3.412 (0.108)	3.018 (0.218)
FEMALE	0.667 (0.265)	0.920 (0.109)
QUANT	0.004 (0.993)	-0.075 (0.873)
EFFORT	0.004 (0.864)	-0.003 (0.894)
ACT_MATH	-0.216*** (0.002)	—
ACT_COMP		0.179** (0.034)
GPA	0.683 (0.184)	0.582 (0.242)
Observations	102	102
Pseudo R ²	0.127	0.077

Conclusion

While several studies have examined the impact of using instructor-created video supplements in the classroom, most of these studies focus on students' attitudes towards podcasts of recorded class lectures. In addition, these studies examine podcasts used in qualitative courses. This study is the first to examine video supplements in a core-level quantitative course. In addition, to our knowledge, this is the first study to explore the characteristics of students who use instructor-created video supplements. Based on the data examined in this study, it appears that the video supplements were used significantly more by students with weaker quantitative skills, as measured by their ACT Math score. Thus, it appears that using video recordings to explain mathematical problems step-by-step can serve as a tool to allow students with weaker quantitative skills to catch up to their peers who have stronger quantitative skills. This study also has important implications for other quantitative-based disciplines, especially those that are part of the general education curriculum, such as statistics, calculus, and accounting, where instructors must balance the needs of students with strong and weak quantitative skills.

Lastly, this is the first study to examine where students would like to see video supplements utilized. Based on student survey results, our study finds that 45% of the students surveyed indicated that they strongly agree that they would like to see video recordings similar to the ones used in this study for all of their classes, while an astonishing 85% of students indicated that they strongly agreed that they would like to see the recordings in all of their math-based courses. Furthermore, when students were asked to list other courses where they would like to see video recordings similar to the ones used in this study, nearly

all of the responses were quantitative courses. Therefore, it appears that the demand for video recordings is highest in quantitative-based courses, even though it seems to be more common in qualitative courses.

There are several limitations to this study. First, the instructor-created videos were explanations to homework questions and did not introduce any new concepts. Stronger students who were able to complete with homework without any problems would have little need to view the videos online. Secondly, the survey regarding the courses where students would like to see video supplements was given at the end of a quantitative course, which may have biased the survey results in favor of quantitative (math-based) courses relative to qualitative courses. Lastly, this survey was conducted at one university, in one course, under one instructor, which limits the generalizability of results.

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