Text vs Video Tutorials for Teaching Policy Analysis: Final Report to the UBC Flexible Learning Initiative

Gabrielle Schittecatte and George Hoberg
August 2015

Overview

- Interest is increasing in university pedagogical innovation, particularly flipped classroom learning and virtual teaching tools
- The effectiveness of and preference for text versus video learning tools to support flipped classroom were explored in two upper level courses in natural resource policy at the University of British Columbia
- While many students preferred access to both text and video based learning tools, when pressed they preferred text
- While most students found video tutorials interesting and more engaging than traditional mechanisms they thought that reading text information was more conducive to their learning than watching a video
- The effects of the learning technology on grades was inconclusive. In FRST 415 assignment grades did not improve with access to video tutorials; in CONS 425 there was a noticeable improvement
- Deeper and clearer understanding of the effects of virtual learning tools could be achieved through further longitudinal and comparative studies.

Introduction

The increasing use of online and virtual classrooms has led to the development of a debate on the pedagogical merits of traditional versus modern teaching styles (Yeung *et al.*, 2009; Luyben & Warden, 2009). One of the modern ideas of teaching is that of a 'flipped classroom learning' (Millard, 2012; Staryer, 2012; Wilson, 2013). This approach departs from the traditional "stand and deliver" or "sage on the stage" model of teaching, where the instructor delivers course content in lecture format. In the flipped classroom approach, students are given material prior to classroom sessions and when they arrive in class they are asked to worked on a problem using the prior information they were given. While the students work on these problems, the instructor(s) circulate the classroom to provide the necessary support.

In the Faculty of Forestry at the University of British Columbia, a flipped classroom approach was introduced to deliver a policy analysis module is two upper level courses, one on forest policy (Forestry 415) and one on energy policy (Conservation 425). In previous years, students were provided written materials to support their assignment to write a 'policy brief' in small groups, and the material was reviewed in class in a lecture with question and answer format. In year 1 of this study, flipped classroom techniques were introduced for four sessions, supported by two-paper written texts that students read

in advance. In year 2 of this study, video tutorials were introduced to allow for an assessment of student preferences and learning impacts of text vs video materials.

Methods

Four tutorials were designed to teach students the steps in policy analysis, as well as the distinguishing factors between a policy analyst and a policy advocate. The tutorials focused on the following themes: problem definition, criteria and alternatives, consequences and trade-offs, and analysis versus activism. All themes were covered by one text and one video tutorial except the third theme, consequences and trade-offs, which text tutorial but two video tutorials. Text tutorials ranged from one to two and a half pages, and the video tutorials from approximately two to ten minutes. Both tutorials contained the same information, although they varied slightly in specific word usage, and in the use of images in the videos that were not contained in the text versions.

The tutorials were released prior to in class tutorials in which student groups would be assigned tasks to complete that were relevant to the learning goal of that specific tutorial. In-class tutorials took place four times throughout the term, the forest policy course in the first term of the 2014-2015 academic year, and the energy policy course in the second term of that year. The views/access of the tutorials was tracked from the release date to the in-class tutorial via the online course management system, Connect. Students had the option of watching or reading the tutorials more than once.

During the in-class tutorials the professor and teaching assistant circulated the classroom to provide student groups with additional assistance in completing their task. The tasks generally involved questions aimed towards aiding student groups in completing a policy brief. The policy brief is a 2000 word document applying the policy analysis framework to a contemporary policy issues (students choose from two or three topics selected by the instructor). The brief outlines the policy problem from a specific stakeholder's perspective, selects criteria to analyze proposed policy solutions, and culminates in a policy recommendation that is then discussed during a simulated multistakeholder negotiation after the briefs have been submitted.

The viewing of both text and video were analyzed, along with the quality of the policy briefs (grade comparison over 2 years) to ascertain the effectiveness of including a video tutorial along with the text tutorial that was employed as a learning tool in year 1. Additionally a survey to assess student satisfaction with the policy tutorial learning mediums was conducted. The results of the viewing and access patterns of both types of tutorials, as well as the responses given on the survey will be analyzed below.

Results

Tutorial Usage
The patterns of student use of tutorials differed between the two courses. In the forest policy course, use increased across the tutorials with the final tutorials having the most views (Figure 1). In that forest policy course, throughout the entire term, there was never a time when all students in the class engage in watching or reading the tutorial prep material in advance. Out of 67 students 29 accessed the first tutorial (43%), 13 the second

(19%), 49 the third (73%), and 57 the fourth (85%). This count includes students that accessed the tutorials in either form.
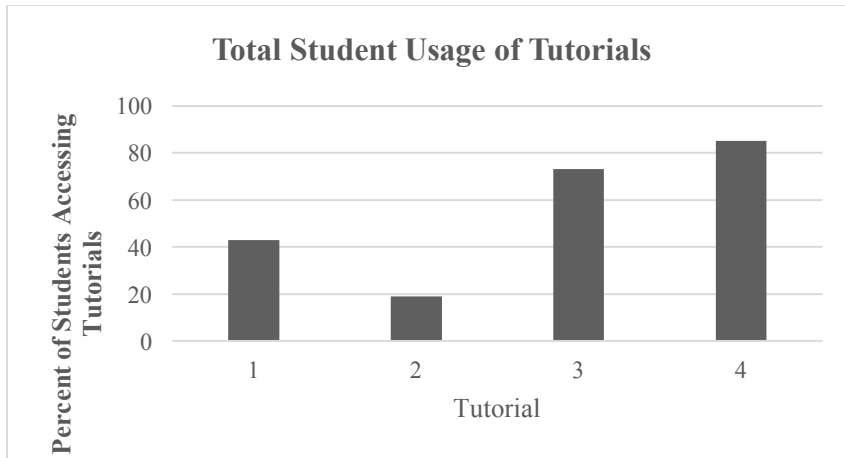
Total Student Usage of Tutorials

Figure 1: FRST 415 - Number of students that employed either the video, text, or both tutorials up until the tutorials took place

Compared to FRST 415 the usage of the tutorials was more stable throughout the term in the energy policy course (CONS 425). Approximately ¾ of students accessed all of the tutorials consistently. As the tutorials did not change in content or in our methods, it is uncertain why this change in use patterns differed so significantly.

In the forest policy course, the video tutorials had a higher usage in the beginning of the tutorial sessions than the text tutorials (Figure 2). This trend is supported by the data gathered from short – answer questions gathered via survey. Multiple students expressed the opinion that, "[they] like the ability to re-read concepts that may be difficult to understand". In FRST 415 many students expressed the preference for the videos, while at the same time understanding that they gained more from the text tutorials. This could be one explanation for the decrease in video tutorial usage and the increase in text tutorial usage. Another explanation is efficiency. Some students expressed the thought that "It's easy to start not paying attention during a video whereas in text you can pick out what's important more easily". It appears that due to the videos' length student often lost focus and then missed the point that the video was trying to express and would then have to go back and watch the video again. In contrast, the text "[was] preferred […]in the simulation tutorials because they were short enough to maintain focus and it was helpful to be able to see the words and not just hear them". That being said students still felt that the video tutorials were useful tools: "Video is a good way to enforce certain concepts and to hear what the professor wants us to emphasize. Text was more useful for quick reference and making notes. The combination allowed for two kinds of learning. I'd say it was better than just text."
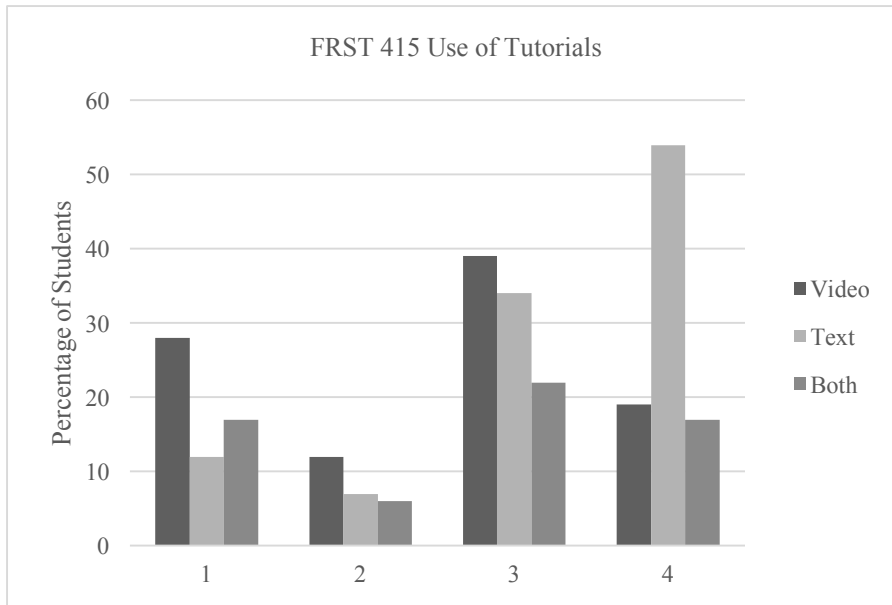
Figure 2: FRST 415 - Tables describing the use of both video and text tutorials across the four tutorials. Also looks at students that accessed both tutorials. This count was made before each in class tutorial

In general, students seem to appreciate the diversity of mediums offered to them, as well as the ability to supplement their knowledge in different ways. We can see this in the data presented in Figure 2. The data shows that almost consistently, excluding tutorial 2, about a third of the tutorial users employed both text and video throughout the term. This is reinforced by the qualitative data. For example, one student said, "Video is a good way to enforce certain concepts and to hear what the professor wants us to emphasize. Text was more useful for quick reference and making notes. The combination allowed for two kinds of learning. I'd say it was better than just text". In a similar vein another student expressed, "The videos were made well and visually attractive so that it was fun and easy to follow. I just also liked to have the text cause it is easier to review it - just nice to have a summary". This is similar to another comment made by a student explaining why having both text and video tutorials was the best option. They said that "[they] used both; it is nice to have a different form though. The nice thing about text however, is that text can be highlighted and re-read instantly. Again, video is a nice option to have and it's a refreshing way to absorb information".
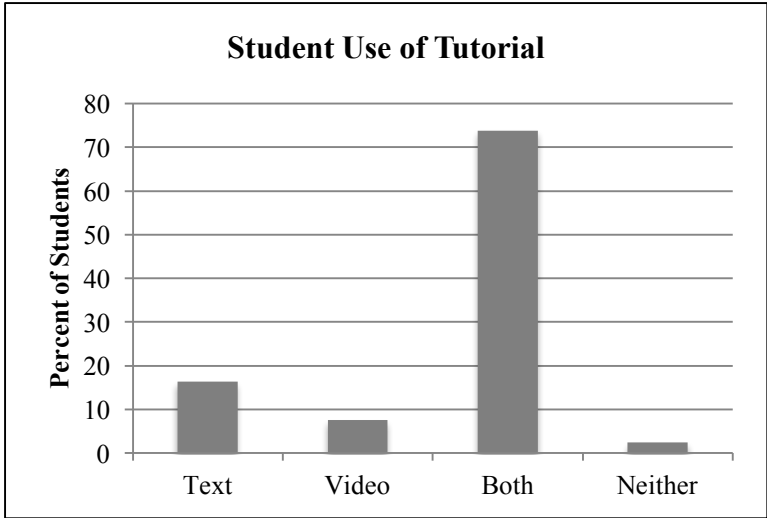
Student Use of Tutorial

Figure 3: CONS 425 – Use of Tutorial by medium

In the energy policy course, usage of both dominated. Out of the 130 students enrolled in CONS 425, 73.8 percent used both text and video tutorials, 7.5 only use video, 16.2 used only text, and the remaining 2.5 did not access the video (Figure 3). In the post-tutorial survey we conducted when asked why they didn't access the tutorials the two anonymous rationales we received were that the student wasn't aware they were available, and that the student had personal issues with their computer that prevented them from access the tutorials.

Student Preference and Feedback
After the culmination of the simulation project, including the submission of the policy briefs, students participated in a survey designed to gauge their preference and experience with the text and video tutorials. They were asked a range of questions regarding which tutorials they preferred, which were the most useful, and which were more conducive to their learning.
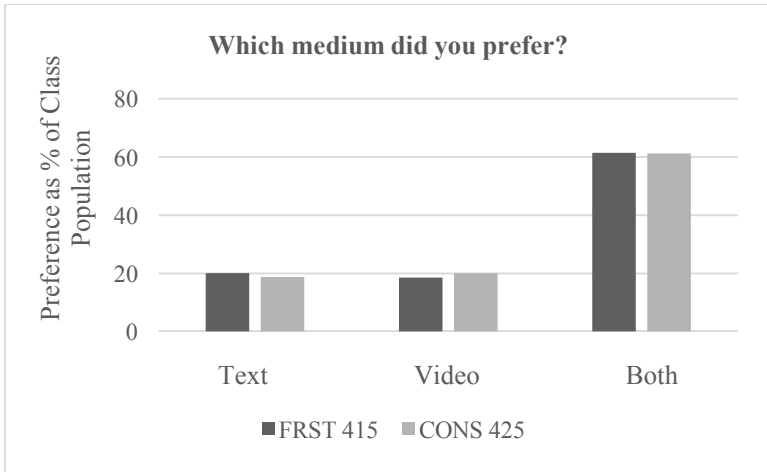
Which medium did you prefer?

Figure 4: Student learning medium preference

When asked which medium students preferred overall the majority in both FRST 415 and CONS 425 answered both (Figure 4). For those who did not pick both, the percentage of students was similar for text and video. When asked to explain their preference, a common answer from students was that the video tutorials were more engaging to watch, but that the text tutorial provided better material to review before using the concepts in class. They also stated that although the video was engaging they sometimes missed points, and that it was easier to go back to review text material than re-watching the entire video.
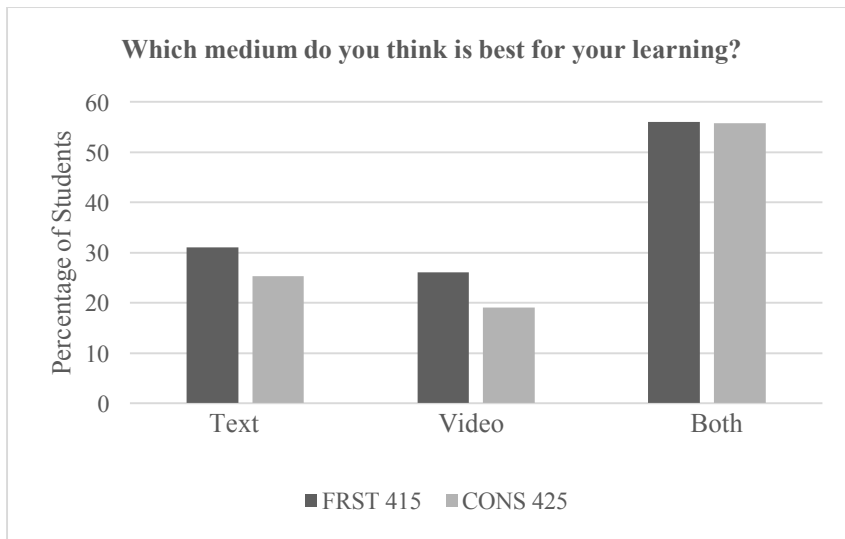

Which medium do you think is best for your learning?

Figure 5: Student perception on the medium that is most conducive to their learning

After being asked their tutorial preference students were asked which medium they believed was most conducive to their learning (Figure 5), setting aside preference. In both classes, the majority of students thought both forms were most useful. Of those that picked only one, in both classes a higher fraction of students thought that the text was more useful than the video. A quarter or less of students in both classes felt that only video tutorials were conducive to their learning. In support of using both tutorials instead of just text or video one student said the following, "The two complement one another. Multi-medium learning helps keep the lecture fresh and stimulating." Another student had this to say regarding why it is beneficial to make both media available, "It helps to watch the video and then if you need to go back and look for something have the text there."

Students in both classes were then asked to decide which medium was most conducive if they had to choose between one medium and the other, without being able to have access to both. The majority of the students in FRST 415 indicated that the believed text was the most conducive to their learning between the two media – 56% vs. 44% (Figure 6). The difference was more smaller in the energy policy course (52% vs. 48%).
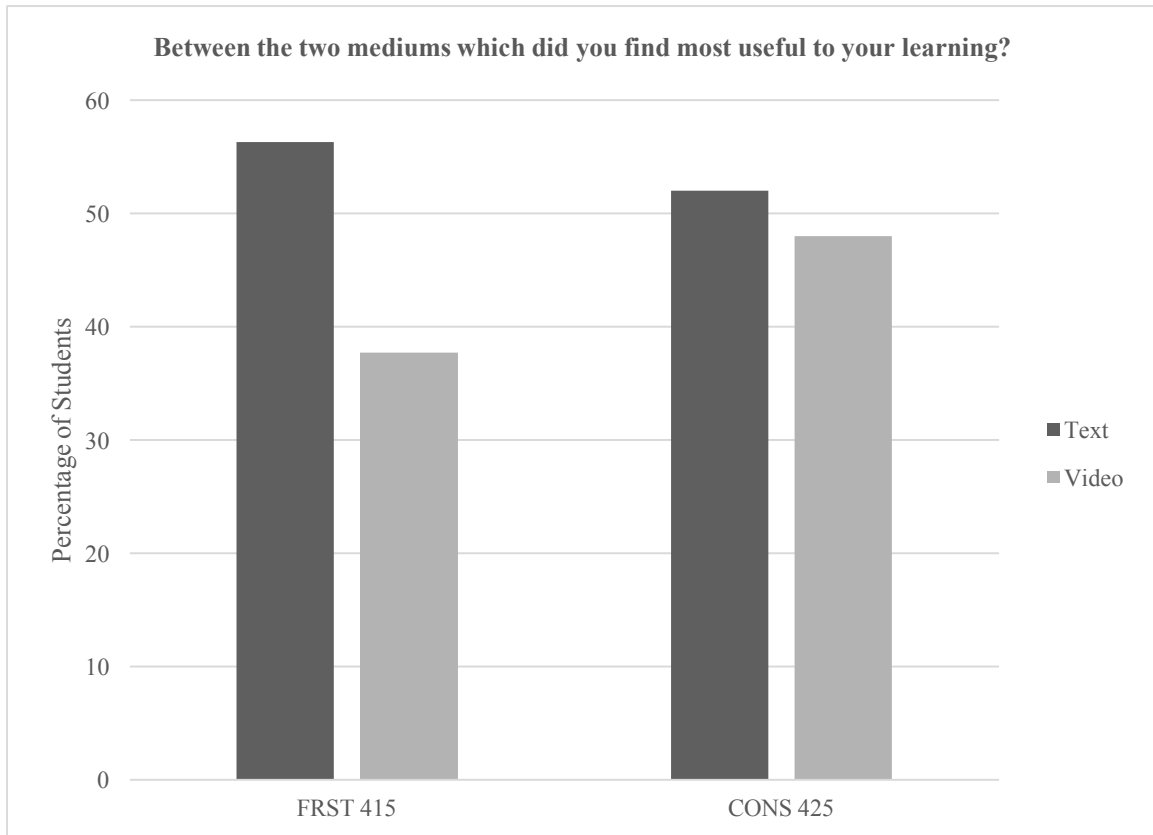
Figure 6: FRST 415 & CONS 425 - Student perception on which medium was best for their learning

In explaining the usefulness of videos, some students appreciated the more dynamic, visual feel of them. On student wrote: "I think the videos are a great, dynamic way to engage learning". Another student said in support of videos over text "I liked to watch the videos since there were graphs and visuals". Finally, several students remarked on the benefits of having visual learning tools instead of the traditional use of text. For example, "the videos were really useful! I'm mainly a visual learner, so I enjoyed them."

The lower preference to video when compared to text, for students in FRST 415, may be explained given the responses to the questions "how useful did you find the text/video tutorial?" (Figure 7). As the tables below depict although both medium were dominantly ranked as "very useful" more than any other available option. However, a small percentage of the class (5.9% or n = 4) ranked the video tutorials as 'very unhelpful'. Furthermore, although both video and text usefulness received positive feedback, a larger percentage of students reported text tutorials as 'extremely helpful' (58.3%) than they did for the video tutorials (47.1%).

Overall, students in both courses found at least one of the tutorials useful or very useful, as shown on Figures 7 and 8.
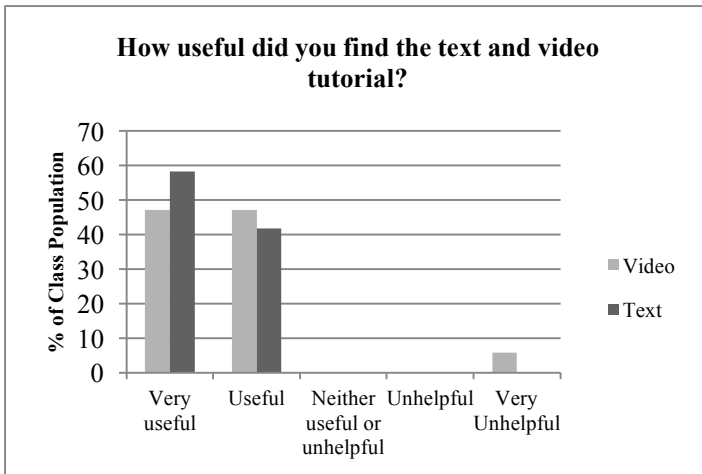
Figure 7: FRST 415 – Usefulness of tutorial by medium

Contrary to the results from the FRST 415 survey, the majority of students in CONS 425 seem to believe that video tutorials were more useful than text (Figure 8). This result is in line with the results from the question that queried which medium students thought was best for their learning.
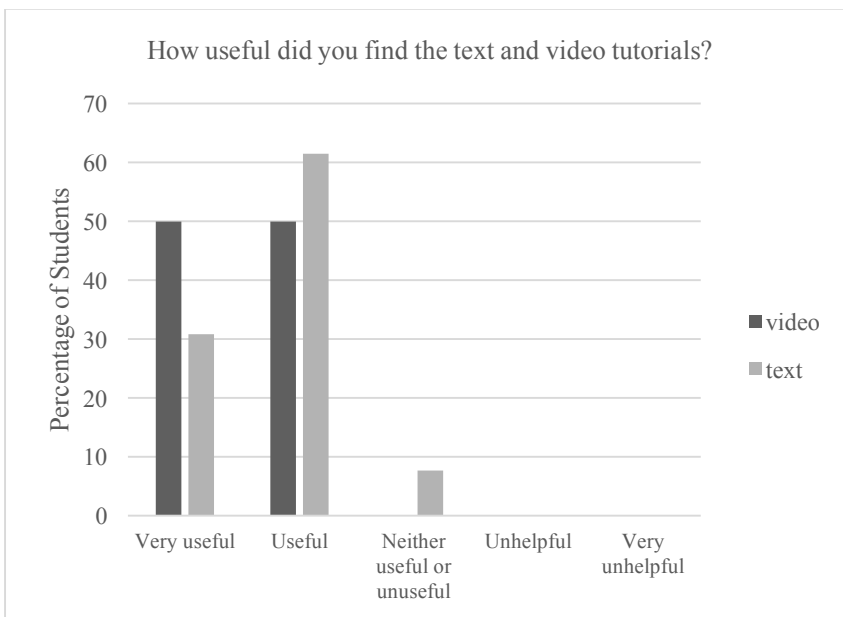

Figure 8: CONS 425 - Usefulness of tutorial by medium

Comparative Grade Analysis

After assessing tutorial access and student preferences, a comparative analysis of the policy brief grades across two academic years, 2013-14 and 2014-15, was conducted. Both sets of briefs were graded using the same criteria, and were coded during the same period (December 2014 & April 2015 respectively). Two coders graded the briefs. Inter-coder reliability was ensured by conducting periodic meetings between coders to review initial grading of briefs. After these meetings adjustments were made to harmonize the

grading standards between coders. The averages of the briefs across topic, and year are the result of this grading scheme.
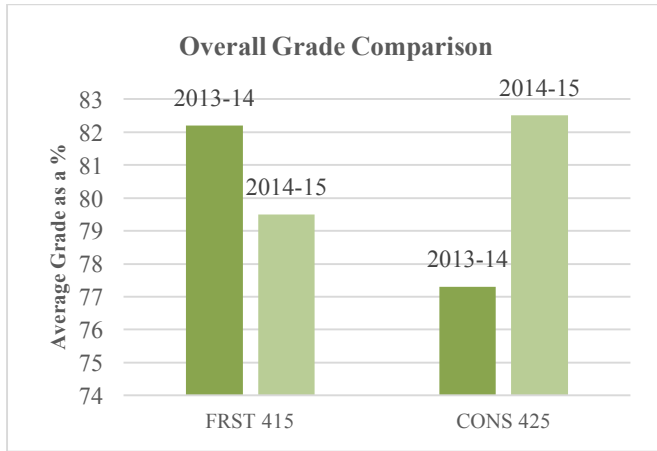

Figure 9: FRST 415 & CONS 425 - Simulation briefs class averages by year

The two courses showed glaringly different impacts of introducing the video materials. Om the forest policy class, grades declined after introducing the videos, while in the energy policy class, the increased considerably. In forest policy in2013-14, when only text tutorials were provided to students, the class average for FRST 415 on policy briefs, inclusive of all topics, was 82.3% (A-) (Figure 9). In 2014-15, when both video and text tutorials were available to students the overall average was 78.8% (B+).

A breakdown of the grades for different simulation topics in forest policy is presented in Figure 10. Over both years the simulation briefs for the area-based tenure simulation had higher averages when compared to the ecosystem-based management (2013) and carbon offset (2014) simulations. Different topics are likely to have different degrees of difficulty, but the decline in grades was still observed in the case that was kept constant in year two (area-based tenure). The differences could have arisen from differences between cohorts, but the grades for other course components suggest that the students in year 2 actually outperformed those in year 1 before the videos were introduced. Average grade in the final exam in 2014-15 year was 74%, but in the previous year it was only 68%.
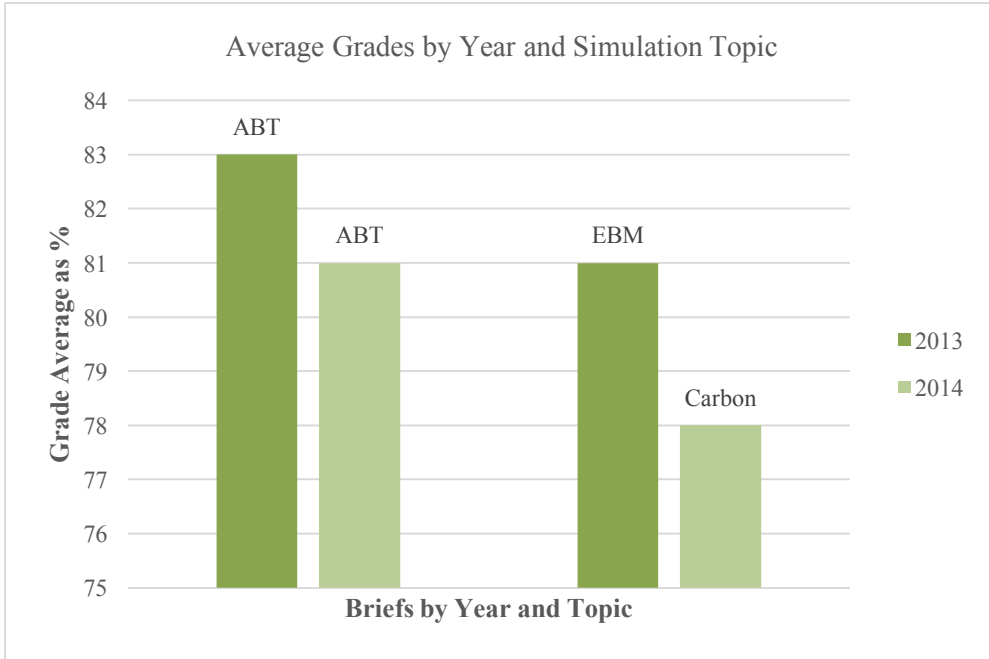
Figure 10: FRST 415 - Simulation brief grade averages by topic and year

Similarly to our analysis in FRST 415, a comparative analysis of the CONS 425 policy brief grades across two year, 2013-14 and 2014-15 was conducted. We can see that students in CONS 425 performed better in 2014-15, with access to video and text tutorials, than in 2013-14 when they had access to only text tutorials (Figure 11).
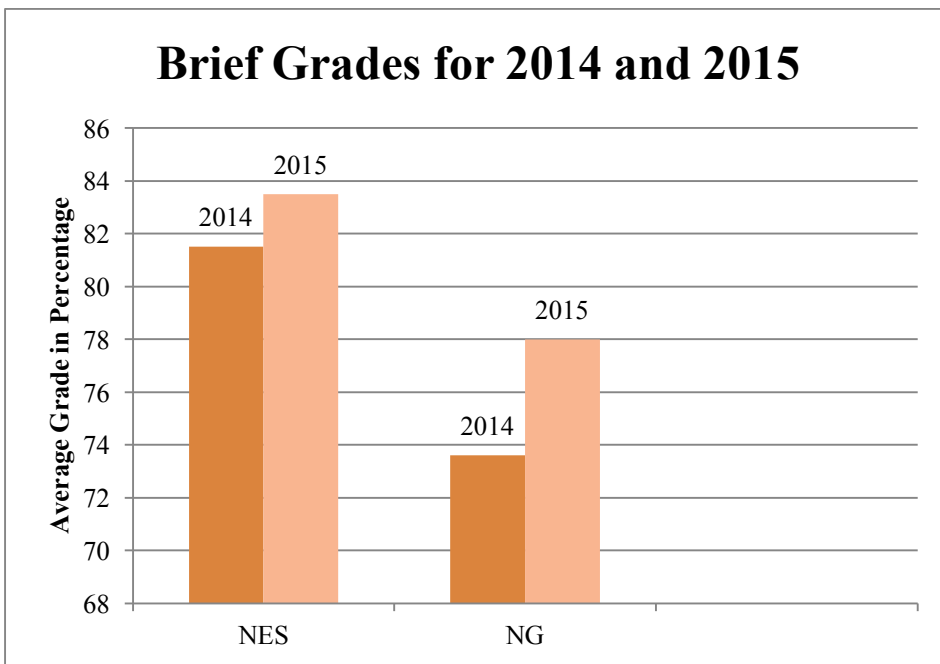

Figure 11: CONS 425 - Simulation brief grade averages by topic and year

In the 2014-15 year, energy policy students averaged 73% on the final exam. In year 1 of the student, they averaged 72%. So in the energy policy class, brief grades increased significantly despite no other indications in the strengths of the students. In forest policy,

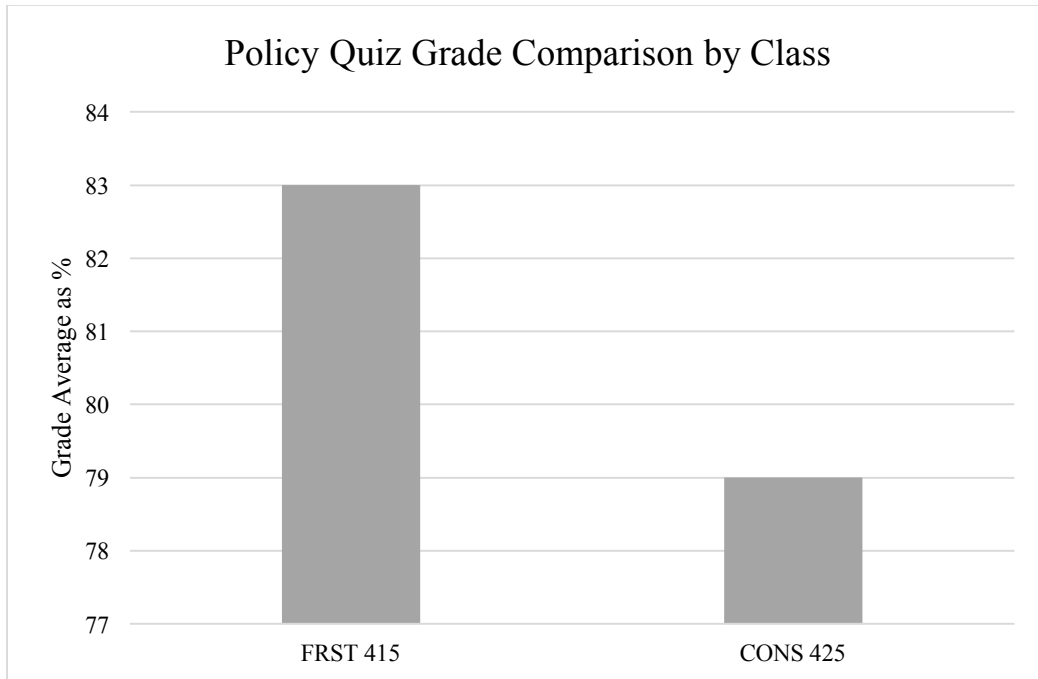brief grades *decreased* after videos were introduced despite indications of a stronger student group.

Figure 12: Policy quiz grade average compared by class

Finally, at the end of the term in both classes an online quiz was conducted to measure what the students had learned regarding policy analysis. This quiz is an individual representation of the students' learning, as opposed to a group one, like the policy brief. Interestingly, although the students in CONS 425 performed better on their briefs, the students in FRST 415 performed better on the policy quiz. This could be for several reasons. First, it could be that because of the group work nature of the briefs that the grades there are an outcome of the understanding of a few strong students who led their group and not of individual understanding. Second, it also seems that more students in CONS 425 received 0/10 on their policy quiz, and the content management system indicated that they did not even attempt the quiz. Therefore, it could be a lack of quiz completion that caused this discrepancy.

Conclusion

To conclude, although this analysis only represents an initial foray into the complex debate surrounding new teaching methods in a quickly evolving digital era it does provide some interesting findings. First, the data supports that both text and video tutorials are useful to students. Second, and in line with the previous conclusion, students seem to prefer the novelty, uniqueness, and quality of the video tutorials. However, they also seem to recognize that for full retention supplementing the video tutorial with text is necessary. This leads us to our third conclusion, that students felt the greatest learning occurred when both tutorials were used. The proportion of students that accessed both types of tutorials supports this. We could not, however, detect any impact of introducing videos on performance. To different classes were given the same new course tool. In one case, their performance on the assignment improved, in the other it declined.To expand

11

on this data and their associated findings the grades of students that had access to both text and video tutorials relative to those students with access to solely text tutorials will be compared in the near future.

Citations

Luyben, P. D., & Warden, K. B. (2009). Comparative Effects of Video-Plus-Text Versus Text-Only Instructional Formats on Acquisition and Generalization of Concept Learning to Real Life Situations. Journal of Educational Technology Systems, 37(2), 159–174. doi:10.2190/ET.37.2.d

Millard, E. (2012). 5 Reasons Flipped Classrooms Work. University Business, 26–30.

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. Learning Environments Research, 15(2), 171–193. doi:10.1007/s10984-012-9108-4

Wilson, S. G. (2013). The Flipped Class: A Method to Address the Challenges of an Undergraduate Statistics Course. Teaching of Psychology, 40(3), 193–199. doi:10.1177/0098628313487461

Yeung, P., Justice, T., Pasic, R. (2009). Comparison of Text versus Video for Teaching Laparoscopic Knot Tying in the Novice Surgeon: A Randomized, Controlled Trial. The Journal of Minimally Invasive Gynecology, 16(4), 411–415. doi:10.1016/j.jmig.2009.02.011