Digital Scholarly Storytelling: Making Videos to Explain Science

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Abstract: Digital scholarly storytelling or digital storytelling in the service of explaining science is currently a blip on the radar of higher education and research on this mode of instruction is hard to come across. This paper reports quasi-experimental research conducted in a higher education nutrition science classroom in Fall 09 and Spring 12. Students participated in a multimedia creation project as an integral part of the course, whereby they collaborated in small groups to create video PSAs about a topic of choice. In order to develop this project, students underwent digital research and multimedia training sessions. They answered pre and posttest surveys about their attitudes and self-reported abilities with reference to digital literacy and multimedia skills, and participated in focus group interviews to discuss their experiences in detail. Survey results show an improvement in their understanding of copyright information and multimedia skills, and focus group interviews underscore the many enjoyable and frustrating aspects of the process. Pedagogical implications are discussed.

Introduction

Student-created video projects involving collecting and presenting video data or telling a scripted story using original footage, music, graphics, animations, etc. have often been studied for their pedagogical abilities. For instance, middle school students in Egypt were taught to use Microsoft Photo Story© to create videos related to any topic of their choice (Sadik, 2008), 10 year old English children were taught to use digital editing software and they created stories related to their school (Pearson, 2005) or college student made podcasts on topics related to Information Technology (Lee, McLoughlin and Chan, 2008). However, the use of digital video in education is woefully under researched, particularly that which is integrated within the established or mainstream curricula (Pearson, 2005 and Lippincott, 2007). A quick review of literature shows that there's a paucity of research about the use of this tool for *scholarly* storytelling, i.e. explaining existing research about a specific topic using original footage, music, graphics, animations, etc. The primary examples of such creations are commercially produced videos, documentaries or digital shorts, but those produced by students are rarely discussed in the literature. For instance, Nixon (2009) describes a digital storytelling project of bilingual high school students where including data was a personal choice, the project was extra-mural and Nixon does not explain if and how students were trained to use the tools of digital and multimedia literacy- something of crucial importance to multimedia creation in education (Lippincott, 2007). In this paper, we discuss a collaborative scholarly storytelling project about nutrition science in a higher education classroom, along with the process by which we prepared students to take on the challenge of translating scientific research into an accessible video PSA.

Student groups in Nutrition 360 are required to create a video PSA on any topic related to nutrition for which they shoot original footage and edit it digitally. A unique inter-institutional collaboration between the instructor, the university's media and technology support unit, and the university libraries sustains this project. The goal is to facilitate students' digital scholarly storytelling i.e. research that is translated and visualized in an accessible manner in the form of a video. The project was studied in Fall 09 and Spring 12. Student feedback in the first iteration drove changes on several counts, discussed in detail later. We were curious about how the digital and library research and multimedia training affected students' perceived abilities and attitudes in every iteration, and what the differences between iterations were, if any. Hence, the research questions for our study were as follows:

i) How does library training affect students' perceived abilities and attitudes toward finding and using digital library resources or other online information sources for class assignments?

ii) How does multimedia training affect students' perceived abilities and attitudes toward creating multimedia for class assignments?

iii) How do changes between two semesters affect

    a) Students' perceived abilities and attitudes toward finding and using digital library resources or other online information sources for class assignments?

    b) Students' perceived abilities and attitudes toward creating multimedia for class assignments?

iv) How do changes between two semesters affect students' experience of learning to, and designing and developing the project?

Data for this study relied on two instances of training: the library training session covered the library's website as well as other online research sources and the multimedia training session covered using iMovie, the

digital editing software, and conducting research for a video. The outcome of the project was a short digital video (up to 1 minute long in Fall 09 and up to 2 minutes long in Spring 12) by each student group, published on Youtube™. Topics included the effect of smoking on nutrition, cooking at home versus eating out, hydration for athletes, daily required protein intake, iron consumption for women, etc. Data was collected using identical pre and posttest surveys and focus group interviews. The survey consisted of 20 questions asking them to identify their previous research and multimedia training, online behavior, attitudes toward and knowledge of digital and library research and multimedia creation. Results were analyzed statistically. Also, in groups of 7-12, students were asked to recount their experience of the process, positive and negative aspects and suggestions for change. These interviews were recorded, transcribed and analyzed qualitatively.

Results and Discussion

Findings from the survey and focus group data are explained here, starting with major themes from the focus group interviews with supporting quotes, followed by a discussion of each research question using survey and interview data.

<u>Focus Group Results:</u>

Although many students were unfamiliar with Macs as well as iMovie, they enjoyed learning a new skill. Editing too was a frustrating but 'intellectually satisfying' part of the process.

> "I liked learning iMovie. I didn't know anything about it before. I think it was really beneficial for me because I can use it later on in life if I ever need it." (Spring 12, Focus Group 3).

They also liked learning to create a video for class as an alternative to writing a paper and as a life skill, especially because they could share it with others.

> "...because you hope that cooking something healthy is better than going to McDonalds and so it was kind of like a test and the fact that it actually came out to be true was really like cool to see." (Spring 12, Focus Group 1).

Several problems cropped up due to a lack of experience using Macs, iMovie and video cameras and in many cases, one or two students handled the editing.

> "And I thought it was hard to split up the actual editing of it because we had one group member who did basically all of it and that was because the rest of us weren't as proficient in the iMovie program, so that was kind of frustrating because I felt we kind of unloaded that all on her and weren't able to help." (Spring 12, Focus Group 1).

For a vast majority of students, research was a small part of the process due to the widely held belief that since the PSA was for laypeople, it had to be simplistic. In addition, students believed that a written paper is deserving of in-depth research more than the video.

> "… if you're writing a paper you need to be able to support everything that you're saying pretty much. But this was like just kind of the facts and then you can present them quickly." (Fall '09, Focus Group 3).

Group work was a frustrating experience for many due to difficulty aligning schedules, although the instructor offered some free class periods in which to work together. Students in Spring 12 had twice as long in which to tell their digital story as students in Fall 09, primarily due to the negative Fall 09 feedback. They had mixed feelings about the schedule of iMovie and library training as well as the pre-shooting deliverables.

> " … it (the iMovie training session) was like so far ahead of when we actually did the editing that you didn't really remember it anyway . If it had been like a couple days before, like the week before I think it would have been much more effective". (Fall 09, Focus Group 6).

They were surprised to learn about copyright information.

> "... I thought that was really informative because I think our group probably would use some type of music off blind like from iTunes or something else with no idea that I--you know you couldn't do that." (Fall '09, Focus Group 1).

Discussion by Research Question

1) How does library training affect students' perceived abilities and attitudes toward finding and using digital library resources or other online information resources?

Knowing *how to "find multimedia resources for class assignments"*, "*use the library's website to find books, articles, etc.*" and *confidence in finding books, articles, websites* all showed a significant difference between pretests and posttest of Fall 09 and Spring 12. Of the variables *not* showing significant differences were the ability and value of finding and using information- particularly reliable, trustworthy information- for class assignments, knowing how to use online information for the same and understanding copyright and ethical use of information. Each had above average scores. Although this result seems to suggest that the library training did not teach students anything new about finding reliable and trustworthy information, copyright and ethics, focus group interviews showed that this was not so and that, in fact, this information surprised students. High pretest scores actually show a mistaken confidence in their understanding of the matter *before* the library training and high posttest scores indicate a now-justified confidence in their ability to find and use appropriate information.

2) How does multimedia training affect students' perceived abilities and attitudes toward creating multimedia for class assignments?

Four variables referring to the ability and confidence in using multimedia software such as iMovie to create videos for class assignments showed a significant pre-test to posttest difference in Spring 12. All except '*creating multimedia for class assignments helps me better understand course concepts'* showed such a difference in Fall 09, one possible reason being that students believed that the necessity of creating an easily understood PSA required them to depend on familiar facts and sources, resulting in lost learning opportunities. This was an undesirable outcome that requires a change in teaching strategy to equip students to incorporate in-depth research in their videos in order to truly accomplish the goal of the project. On the other hand, since this data did not include a performance measure, the learning outcomes are speculative rather than definite.

3) How do changes between two semesters affect students' perceived abilities and attitudes toward
   i.   finding and using digital library resources or other online information sources
   ii.   creating multimedia?

We conducted an independent t test to compare the pre and posttest results of the two semesters respectively to find differences, if any, between groups. Pretest comparison showed that students in the two semesters significantly differed from each other on eleven variables with few similarities; they scored low on their perceived ability to create videos or their confidence about the same. They also scored low on the belief that they can find everything they need through Google. This was surprising since in every survey, between 86% and 97% of the students identified themselves as frequent users of Google search.

Post-test comparison showed non-significant differences on fourteen of the seventeen variables compared, i.e. three significant differences. We found that, students' perceived abilities and attitudes toward finding and using digital information as well as creating multimedia changed over the course of each semester to become overwhelmingly similar such that the two groups differed on only three variables. Two of these were *I know how to create a video using iMovie or other multimedia software* and *I am comfortable using technology to create videos, podcasts, and other multimedia for class assignments*, with mean scores higher in Fall 09 as compared to Spring 12. Since pretest scores for the former were similar in both semesters, it is interesting that the Fall 09 group showed a stronger posttest agreement. With regard to the second variable, the two groups differed significantly in the pre as well as posttest surveys, making it harder to compare their post-test differences. Although this may create the impression that students' scores on these variables dropped in Spring 12, this comparison is in fact harder to interpret given the quasi-experimental nature of this study and the duration between the two iterations.

4) How do changes between two semesters affect students' experience of learning to, and designing and developing the project?

The two semesters differed in terms of four aspects of intervention.

a) After Fall 09 findings showed that student groups did not conduct in-depth research for their PSAs and many videos lacked citations, we incorporated research training into multimedia training to underscore its importance. Unfortunately, the belief that 'PSAs don't need research' remained dominant and we did not hear differently in the interviews of Spring 12, although in-video citations improved.

b) Students from Fall 09 complained that many did not get an opportunity to interact with iMovie during the training, since they were not seated individually. Therefore, in Spring 12, both multimedia and library training were conducted in the university's Knowledge Commons (a technology rich learning center), offering individual machines as well as a more student centric, collaboration friendly spatial arrangement, with the result that the earlier complaint was conspicuous by its absence.

c) Students in Fall 09 blamed the fact that pre-video deliverables were scheduled several weeks in advance of their video submission for a lack of psychological connection between the deliverables and the final product. So, Spring 12 saw a tighter timeline, eliciting a more mixed response from the students – particularly the positioning of spring break right before the submission date.

d) The most equivocal complaint from the students in Fall 09 was about the time limit afforded to them (1 minute). They pointed to the rushed nature of their as well as others' videos, which purportedly was a result of having to 'cram' all the information in such a short period of time. Therefore, students in Spring 12 were allowed to work with 2 minutes, with the hoped-for outcomes of more positive feedback about the new limit as well as improved overall video quality.

Pedagogical implications of creating multimedia for class

- Realizing while filming that what their storyboards would not work was an important learning experience in creating video for class and this possibility should be emphasized.
- Students may need to be advised about the time investment necessary for a video as short as 2 minutes.
- Translating academic research into an accessible story tested students' creative skills in ways not demanded by papers or presentations and introduced most to a new form of sophisticated communication.
- Creating something they could 'show' over writing or talking about it, and sharing it with their class, friends and family substantially added to students' engagement in the project.
- Copyright education was crucial in order to prevent students from violating copyrights.

Recommendations for future research

- According to Cox, Vasconcelos and Holdridge (2009), "translating book learned knowledge into visual forms involves a specific type of intellectual challenge" (p. 831), and the conditions and implications of meeting this challenge successfully need to be in the spotlight, as this study does.
- Students learned to use a new form of communication befitting a generation entering the 21st century workforce. As Daley (2003) believes, the truly literate of this century will be the ones who speak the language of multimedia. We need more research to understand how to help students be fluent in it.
- The foci of this project were content expertise, digital literacy as well as multimedia literacy, supported by a unique inter-institutional collaboration. It will be worthwhile to understand if and how it works toward improving student performance and usage of information and media facilities over time.

References:

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