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Digital Video Projects of, by, and for New Teachers: The Multiple Educational Functions of Creating Multimedia

CHRISTOPHER HALTER AND JAMES LEVIN
University of California - San Diego, USA
chalter@ucsd.edu

A three year study of digital video creation in higher education investigated the impact that creating short digital videos by university students in their final class of a teacher education program had on those students. Each student created a short video reflecting on the process of how he/she became a teacher. An analysis of the videos themselves, analyses of surveys of the former students soon after they created the videos and also years later, and analyses of the number of views of and comments on the videos show that creating these digital videos served reflective, communicative, and memorial functions for these former students. Creating the digital videos functioned as a novel and powerful form of reflection for the teacher education students as they completed their program, helping them put their preparation for teaching in a broader perspective. The digital videos helped the students better communicate to others why they had chosen to become teachers. The digital videos also functioned as artifacts years later for teachers to remind themselves of why they became teachers in ways that helped them maintain their commitment to continue teaching. These three functions of creating multimedia projects served as powerful supports for new teacher learning.

INTRODUCTION

The creation of digital videos by students is becoming more common, as the hardware for capturing video becomes ubiquitous and the software for editing becomes easier to use. Research has examined the impact of creat-

ing digital video stories on K-12 students (Hull & Katz, 2006; Nixon, 2009, 2012) and on pre-service teachers (Heo, 2009, 2011). Does the creation of digital videos by teacher education students near the end of their program serve as a "capstone" of their program, helping them bring together what they had learned in a way that would help them transition to practicing teachers? Does the creation of videos serve to help these students use video as a teaching tool in their own teaching? These are some of the questions that motivated the instructors when they introduced the creation of individual digital video projects into a course that has been taught for the past several years.

Conceptual Framework

This research examines the role of digital videos as artifacts for learning (Becvar, 2007, 2008; Hutchins, 1995; Norman, 1991) among university students in a teacher education program. This work is grounded in the theoretical framework that reflection and reflective practices can be used to support professional growth, foster agency, and define professional identity. Reflective practice has been shown to support professional growth (Darling-Hammond & McLaughlin, 1995; Borko, Michalec, Timmans, & Siddle, 1997) and to be used as markers of that growth (Halter, 2008). Previous research (Cole, 1996; Holland, 1998) suggests that identity and agency can be supported via semiotic means, as described by Vygotsky (1986) and embodied in cultural artifacts. Hull and Katz (2006) suggest that digital storytelling projects may serve as cultural artifacts. Other fields of study have also suggested that digital storytelling projects can serve as representations of a personal identity (Kenyon & Randall, 1997; Damianakis, Crete-Nishihata, Smith, Baecker, & Marziali, 2010). Kenyon and Randall (1997) describe this relationship between self and identity as "we not only *have* stories but *are* stories" (p. 11). The idea that "we are the story" points to the complex relationship each individual has with his/her own life stories as artifacts for learning, reflecting, communicating, and remembering.

Reflection has been described as a marker of professional growth (Berliner, 1988; Chi, Deleeuw, Chiu, & Lavancher, 1994; Dreyfus, 2004; Feiman-Nemser, 2003; Schön, 1991; Van Manen, 1999). Reflective practice is a vital component in progressing from novice to expert (Adler, 1990; Bauer, 1991; Feiman-Nemser, 2001a; Ferraro, 2000; Schön, 1987; Van Manen, 1999). New teachers need to examine and re-examine classroom events to analyze the effects that their actions had on student learning. Schön calls this the "artistry of good teaching" (Schön, 1989). As novice teachers gain expertise in their own teaching practice, they engage in this reflective practice and develop new understandings about teaching and learning (Campoy

& Radcliffe, 2002; Clark, 2001; Danielewicz & NetLibrary Inc., 2001; Danielewicz, 1998; Feiman-Nemser, 2001b; Freese, 1999). Schön (1987) describes the lineage of these ideas as coming from Dewey, Schultz, Vygotsky, and Piaget's work on reflection and personal growth.

Schön describes reflective growth as an increase in complexity as the teacher gains expertise. The teacher moves along a continuum of being able to step back and reflect on their teaching, to making those conscious decisions while teaching, to gaining the tacit knowledge of an expert teacher. As Schön (1987) describes reflection as a social process that is embedded in practice, two important ideas converge. The first idea comes from the Vygotskian theory of learning and social interaction. Vygotsky proposed that learning is scaffolded within a zone of proximal development (ZPD), the gap between what an individual can accomplish independently and what he or she can accomplish with the help of a more competent other (Moll, 1990). This concept of learning within a social context is furthered by the idea of "communities of practice." Participants develop knowledge within a structured social framework (Lave & Wenger, 1991; McLellan, 1996) as members of a community that works together to understand and develop knowledge in a specific domain (Eden, 2002). Knowledge development within a community of practice supports the development of expertise in novice teachers as a domain specific skill (Chi, Glaser, & Farr, 1988). It also may support the development of their teaching identity.

Research on reflective practice suggests that reflectivity leads to professional growth and expertise, and some researchers even argue that the attainment of expertise is not possible without reflection (Allen & Casbergue, 2000). The use of video as a tool to support teacher development and reflection has been shown to be an effective tool to promote growth with new and pre-service teacher candidates (Van Es & Sherin, 2002). Subsequent studies have validated the use of video and video production as a vehicle to support teacher development. Lazarus and Olivero (2009) found that traditional forms of reflection had little impact on supporting a new teacher's understanding and view of classroom practice. They further argue that viewing video of one's own practice offered a different perspective on teaching and supported more productive forms of reflection.

The use of video to support new teacher reflections seems to contribute to more advanced levels of new teacher reflection (Halter, 2008; Osipova, Prichard, Boardman, Kiely, & Carroll, 2011; Etscheidt, Curran, & Sawyer, 2012). Through the use of video, new teachers were able to demonstrate more sophisticated levels of reflection, as described by both Schön (1987) and Van Manen (1999).

Much of the existing video reflection research has been focused on teachers viewing their own classroom practice and the teachers' views of

the classroom. Self-analysis of classroom practice becomes the main narrative of the reflections produced by new teachers. The reflections are concerned with new teacher practice and student learning. Tripp and Rich (2012) point out that there is little research on the long-term outcomes of video reflection by new teachers or the impacts on new teacher learning.

Cheng and Chau (2009) examined the use of video reflection within a community and shared through ePortfolios. They found, as did previous studies, that video can support richer, more focused reflections by new teachers. In addition they found the creation of video reflection by new teachers to be a powerful motivator when coupled with peer comments. This motivation was more effective than merely showcasing their videos or the impact of instructor assessment.

The research question for this study is: What is the impact on new teachers of creating videos describing their own processes of becoming teachers?

METHODS

Teacher education students at a university in southern California created individual digital videos describing their own growth as teachers as a major class project in one of their last courses before graduating. The course was a four-week summer session course, a part of a Master of Education/teacher credential program. The majority of students had recently completed their student teaching assignments and received their preliminary teaching credentials during the course.

During the first class meeting, the entire cohort of students was shown videos created by students in the previous year's cohort in the same course, as a shared viewing experience. Students then engaged in an individual evaluation activity reviewing digital videos created in previous years. Each student wrote a description of his/her preliminary ideas for a video in an individual blog, and received feedback from their peers and the class instructors. Next, each student wrote a script and created a storyboard for his or her video. The project of creating digital videos was described in the class syllabus in this way: "You will create a digital video that will highlight your teaching growth and practice." Each of the digital videos in this project was limited to 5 minutes in length or shorter. The students posted their videos to YouTube under a Creative Commons Share-Alike license.

Each video was then reviewed by peers and the class instructors using an evaluation rubric, and was shown by each student at a celebration of the completion of their teacher preparation program. The top five videos were featured on the home web page of the Department offering the course. A more detailed description of the supports provided for student video cre-

ation is contained in Appendix A. In addition to peer and instructor evaluation, the students receive formative feedback on the video production as well as the accompanying narratives.

The videos are accessible to a wider audience through YouTube and the top five videos each year are showcased on the department website. Students also create ePortfolios during the program. These ePortfolios are hosted on a public website portal, currently Weebly.com. By using the html embed code provided by YouTube, students integrate their video projects directly in their ePortfolios.

This paper analyzes the impact that creating these digital videos had on students in this class over a three year period. Approximately sixty students created digital videos per year.

Three data sources were used in this research:

1. Analysis of the set of digital videos that the students created
2. Analysis of video sharing website view numbers and comments
3. Results of annual surveys of former students conducted over three consecutive years.

Survey instruments were sent to participants in the course annually in 2008, 2009, and 2010. Links to online surveys were sent by email to former students who had just finished the course, former students who had finished the course a year before, and former students who had finished the course several years before. Responses were anonymous. The surveys were distributed during the late summer several weeks after the course had ended. Responses from earlier surveys were used to adjust and focus questions on subsequent surveys. The surveys were sent to overlapping cohort groups each year. The first survey, distributed in August 2008, consisted mostly of Likert scale responses with a few open response questions. These open response questions provided direction and guidance to refine the survey instrument. The subsequent surveys, distributed in August 2009 and August 2010, contained only open response questions that were more targeted and designed to gain insight into comments made on the initial survey. The 2010 survey is contained in Appendix B. Over the three year period, 168 participants were invited to complete the online surveys with 58 participants completing them. About a third of the participants responded, with annual response rates varying from 44% to 22% each year, as shown in Table 1.

Table 1
Return Rate of Surveys

Survey Group	# in Course	# Surveys Received	Return Rate
2008	47	18	38.3%
2009	61	27	44.3%
2010	60	13	21.7%
Totals	**168**	**58**	**34.5%**

RESULTS

Analysis of the videos

Several analyses of the digital videos themselves were conducted, to determine the nature of these artifacts for learning. Despite the fact that these digital videos were created with a common prompt within a relatively uniform supportive environment, they differed quite a bit. Digital stories have been defined as "a short, first-person video-narrative created by combining recorded voice, still and moving images, and music or other sounds" (Center for Digital Storytelling, 2012). About 50% of the digital videos created by the students in this study fell within this definition. Despite the fact that the students were introduced to their video project each year as digital story making, many of the video projects are not narrative stories but instead other rhetorical forms, including third person fantasies, expositions, demonstrations, and a variety of other formats. Some of these alternative forms have been judged to be among the best of each year's videos by fellow students and faculty.

Each year, the top five video projects from each cohort, as judged by a ranking of their peers, have been featured on the home page of the web site for the Department offering the course. This ranking process was part of the course - the students used an on-line rubric form to evaluate their peers' video projects near the end of the course after the deadline for the video project completion. These five replaced the bottom five ranked videos of the previous top ten, again as judged by the students in the class at the beginning of the course, using an online rubric similar to the one they used to evaluate their cohort members' videos.

The top ten videos featured during the 2010-2011 academic year were classified by dominant rhetorical mode: narrative, description, exposition, or argument (Connors, 1981). Five of the top ten videos were narratives, 4 were descriptions, and 1 was an argument. In many cases, the other modes were used in service of the dominant mode. For example, in the argumentation video project, the main argument posed at the beginning of the video

(that you can change the world by being a teacher) was supported by a narrative of the life of the student creating the video. In another case, a narrative "letter to the world" was supported by an exposition of how to learn to tap dance and an analogy between tap dancing and teaching. One of the narrative videos contained two parallel narratives, drawing an analogy between becoming a teacher and running a marathon race. An important lesson learned from this analysis is that video projects created by teacher education students can take the form of multiple rhetorical modes, not just stories, and that while many of the digital videos will be stories, many of the best will take other rhetorical forms.

Is this distribution of video project rhetorical modes due to the selection of these ten videos as exemplary? To check this, ten of the sixty-six videos created during the summer of 2011 were randomly selected, and the same classification of these ten into the four rhetorical modes was carried out. Of these ten, five were narratives, four were descriptions, and one was an exposition of the process of gardening (and its relation to teaching). So both in the exemplary video projects and in the random sample of all video projects, narrative is the modal rhetorical mode, but the other modes are also represented, with descriptions being more common than expositions or arguments. This is shown in Table 2.

Table 2
Distribution of Main Rhetorical Functions of Video Projects

Main Rhetorical Function	Exemplary Video Projects	Random Sample of Video Projects
Narratives	50%	50%
Descriptions	40%	40%
Expositions	0%	10%
Arguments	10%	0%

In reviewing the digital videos of these new teachers, they often showed signs of "restorying", the retelling of one's life story. Pre-service teachers, especially when placed in difficult situations, struggle with their professional identities. Too often their ideals when they entered the teaching profession conflict with the actual day-to-day experiences at schools. The digital restorying seems to be a way for them to negotiate these differences and to come to some new understanding of themselves and their place in the teaching profession. Restorying has been described as a cognitive strategy that promotes learning and understanding from different perspectives (Slabon, 2009). In restorying, there is an impact on both the storyteller as well as the audience in understanding a complex real-world problem or issue. In this case, the digital video creation seems to have served as a restorying strategy to help the video creators make sense of their challenging life experience,

namely assuming and living the role of a teacher. The restorying process is both reflective as well as proflective (Kenyon & Randall, 1997). These student storytellers, in making sense of their pathways into the teaching profession, are looking back as well as ahead, in making sense of their experiences.

Analysis of the uploaded projects in a video sharing website

A requirement of the video project was for students to upload the videos to an online public video sharing website (YouTube). This process facilitated access to the projects by faculty and cohort members. This also gave the students a potentially broader, authentic audience who could access, view, and comment on their projects. Students within the same cohort were encouraged to view and provide critical feedback to their peers. They could leave a comment for any video project that did not already have 5 comments posted. Students in subsequent cohorts were also encouraged to view the previously submitted video projects as models when they began the production of their own project.

The view counts for these video projects are much higher than initially expected. Figure 1 shows that while some video projects had very high view rates, others had relatively few views. Some 2009 video projects had been viewed 2955, 2127, 1638, and 1211 times, others from the same cohort group have been viewed as few as 1 to 5 times. Over time the view rate for a subset of the student videos increased, with the median view rate across subsequent years displaying a moderate increase over time. The video projects were usually not discarded or deleted by their creators but continue to be seen by a wider audience beyond the program faculty or the cohort group during the course. The total numbers of views for all the projects created by the 2009, 2010, and 2011 cohorts were 15,666, 4,526, and 2,949 respectively.

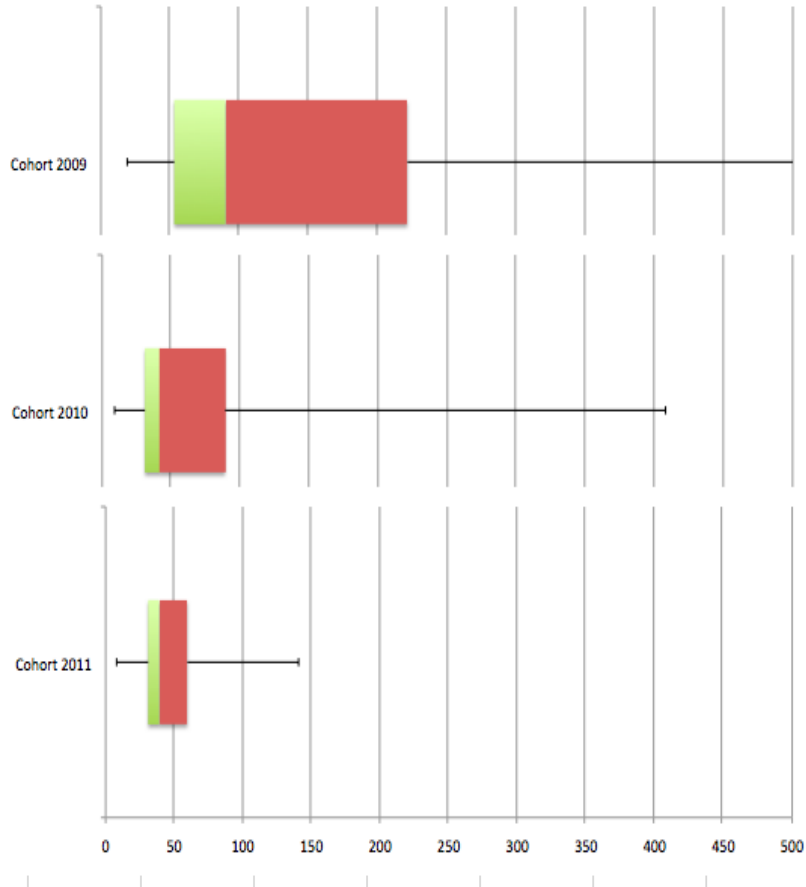


Figure 1. Box plot of the view count for video projects located on an online video sharing website, 2009 cohort (N=15,666), 2010 cohort (N=4,526), 2011 cohort (N=2,949).

The box plot in Figure 1 shows that the number of views increased each year, as the video projects remained available in the online sharing website. The overall number of views for some video projects rose to a few thousand while others had just 3 to 5 views. The variance increases over time while the median number of views remains fairly constant, between 40 and 90 views. This number exceeded the number of views generated from the class in which these videos were generated, which should be approximately 12 views per video project. Each year five video projects are selected to be

part of the "Top Ten Videos" presented on the department web page. The other 5 video projects are from previous year groups. Each video featured on the top ten list from the 2009 cohort would be expected to receive at least 80 views by the 2011 academic year since they are used by subsequent cohorts during an evaluation activity. The top ten projects would have been evaluated and viewed by 25 to 40 students in each of the 2010 and 2011 cohort groups. The intent of the exercise was to have students become familiar with the form their own projects could take and the rubric used to assess their work. However, as is shown in Figure 1, over half of the video projects from the 2009 cohort received 90 or more views.

Visitors to the video sharing website can also post comments about the individual video projects. Fewer comments were made than the number of views of each video. Figure 2 shows the box plot for the 2009 cohort video project comments (N=416). In analyzing the source of these comments, 95% came from members of the same cohort group, 3% came from members of subsequent cohort groups, and 2% came from users outside of the cohort group such as family, friends, K-12 students, and other users. Comments on the video projects posted by cohorts in 2010 (N=31) and 2011 (N=66) are fewer and, to date, all of these comments have been from members of the same cohort group.

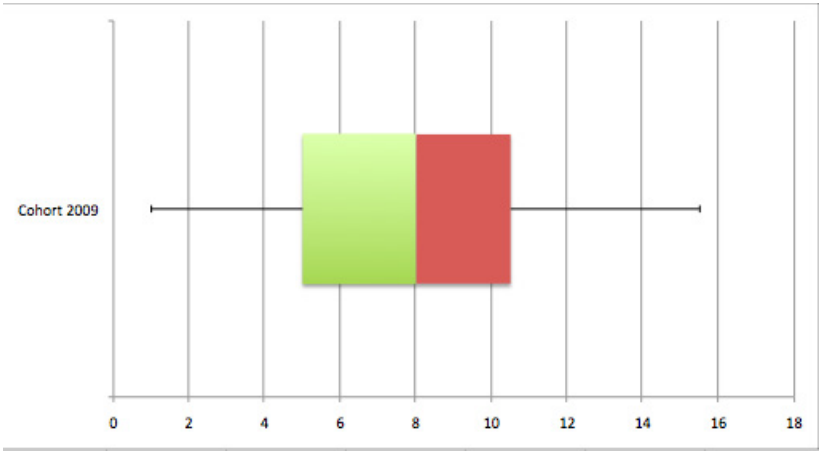


Figure 2. Box plot of the comment count for video projects located on an online video sharing website for the 2009 cohort (N=416).

The comments posted by members of the same cohort tended to be positive, supportive, and general in nature. They carried the same tone that one would expect to be posted in a social network. Here are some typical com-

ments: “l can tell you put a huge amount of effort into your video. Your narration is extremely passionate and very reflective of you.” and “I was completely engaged and loved the voice you put into it. What made it even more powerful was the conversations you had with your students.” These comments seemed to be a way for the cohort members to build cohesion with one another. These supportive interactions may be part of a beginning teacher’s need for collegiality that may later play a role in teacher retention (Inman & Marlow, 2004). Supportive comments made up the vast majority of the intra-cohort interactions.

In contrast, the comments posted by students from subsequent cohorts had a different tone. These comments typically began with positive but general observations of the video project, then they would conclude with some reflection back to the commenter’s own experience. Comments such as “I’m an secondary Education major and I just wanted to say I love your video. I have apprehensions and fears about my future as a teacher that I know all educators must face one day” and “Thank you so much for this video. It is my first year of teaching and I just got through my first semester. I have felt and experienced all of the things that you mentioned in the beginning.” These comments seem to be an opportunity for the commenters to consider and reflect on their own experiences to make sense of both learning to teach and to work through what they might present in their own video projects. Of the comments posted by students in subsequent cohorts, 50% exhibited this reflective turn.

Analysis of the surveys

The results of the three annual online surveys were analyzed. These results included responses from those that were sent to former students who had just graduated from the teacher education program, those who had graduated the year before, and those who had graduated more than a year before.

The original goal of the instructors for including this project was that the teacher education students in this class would have their own K-12 students create digital videos once they graduated. The results of the surveys for those who had been teaching for a year or longer indicated little use of digital video creation by former students in their own teaching. Some of these former students described barriers to involving their own students in digital video creation, including lack of technology in their classroom and lack of time in their curriculum given the increased focus on “meeting standards”.

However, some of the former students, especially those that had been teaching for several years, mentioned that they viewed their own digital videos again in order to remind themselves of why they had chosen to become a teacher. They reported that this “reminding” function served to prevent

"teacher burnout" that is common in the first years of teaching. This long-term impact was not one of the goals when this project was first added the course, but the instructors were both surprised and pleased to see it emerge.

Each response from the three surveys that expressed a way in which the video project served some function for the video creator was identified. The 78 different functions were then grouped together into clusters that expressed similar functions. There were six groups of functions that had more than one response, shown in Table 3.

Table 3

Reported functions that the video projects served for the creators (N=78 total responses with N= 57 responses falling into specific categories)

Function served by the video project for the creator	Number of responses
a different sort of reflection on becoming a teacher	15 (19%)
more effective communication with others about becoming a teacher	15 (19%)
creative self-expression	10 (13%)
reminding oneself about why one became a teacher	7 (9%)
learning more about how to create videos	7 (9%)
other uses of videos afterward	3 (4%)

A Different Sort of Reflection

The survey specifically asked respondents to compare the reflective activity of creating their digital video projects with other reflective activities during their teacher credential program. During the entire teacher education program, credential candidates engage in multiple oral as well as written reflective activities as they analyze daily lessons, unit planning, K-12 student assessment, as well as classroom experiences and interactions. In the survey, 92.5% of respondents reported that the digital video activity seemed to be a different sort of reflection than other reflective activities they had experienced. The digital story reflection was described as being "personal" in nature and "creative".

Respondents also commented on the use of multimedia elements to support and act as artifacts for the reflection. The digital video project took advantage of images, music, text, and the spoken word. These elements created a rich experience shared by the creators as well as their audience. One respondent said "I had to connect to it on a whole new level. Using my voice, my pictures, and a song that has real significance made the video reflection more personal than any written reflection could be."

The personal nature of this reflective task had a powerful influence of the respondents. Former students reported that the digital video task was "very different from the written reflections because it seemed more like a piece of me" and that it "allowed us [the credential candidates] to delve further into our being." The idea that this was a much more personal exploration is echoed by another response stating that "other reflections may have been a little more abstract and were reflections of the external, whereas this video was more of an internal reflection." These comments are representative of those received from the majority of respondents.

While reflection was emphasized throughout their teacher education program, many of these former students commented on how this particular activity allowed them to reflect in a different way. One former student said "It was a more creative method and more expressive way to allow us to reflect on our past experiences." Another pointed to the "capstone" nature of the video project: "I think it was a nice way to end the program with a reflection that was not just writing a paper." While the instructors didn't think this prompt required an epiphany from the students, one former student reported: "in forcing us to have an epiphany in our video and giving us lots of small activities to prepare us for the final project, I actually did have an epiphany about myself. I was able to discover how I view things, what experiences have the greatest impact on me, and what personal goals I am achieving by becoming a teacher."

More Effective Communication with Others About Becoming a Teacher

Other former students reported that the videos allowed more effective communication with others about why they were becoming teachers. One former student said she viewed her video as "being able to convince close friends and family of why I chose teaching as my career. Somehow it conveyed my thoughts more eloquently than I could explain them in words." Another was surprised by the increased communication among her peers: "We actually WANTED to show them to one another. That was surprising." A third described how the video was used in his own K-12 teaching: "I have shown it every year to inform my students (and remind myself) that I know what it's like to fail and I know what it's like to recover from and overcome failure." And one commented on the impact the video has on following cohorts of teacher education students: "my video has been seen by students that came in after me and most have them have responded positively to it." Since the video projects are online public documents, students can communicate and provide feedback to one another despite being in cohort groups during different academic years.

Reminding Oneself About Why One is a Teacher

Most surprising were the responses that described how the videos served as artifacts years after being created to remind the creators of why they had become teachers. One former student said: "It is also fun to have it in the future to look back, especially on days when I wonder WHY I am a teacher. :o)". Another said "it is good to have a permanent record of how I felt about the classroom before I became entrenched in the profession."

Research (Boe, Cook, & Sunderland, 2008) shows that rural schools and urban schools with high minority, low SES student populations are the most difficult to staff since those schools experience high levels of teacher turnover each year. Among the factors that influence a teacher's decision to leave a school and the teaching profession include personal, professional, or a combination of both (Inman & Marlow, 2004; Boe et al., 2008). New teachers with less experience are often initially hired at schools experiencing high teacher turnover. Often new teachers entered the teaching profession with ideals about working with children and having positive impacts on their lives. Rice (2010) points out that more effective teachers seem to be motivated by professional factors in their decisions to continue teaching, often citing their desire to *make a difference*.

References to this intrinsic desire to make a difference emerged as a theme in the reasons why the former students reviewed their own digital projects years after the completion of the program. Many of the video projects contained references and rationalization discussing this desire. The reminding function may be a way for these relatively inexperienced teachers to tap into those earlier professional, intrinsic motivations to teach as they perhaps struggle with decisions about whether to continue in the profession. Slabon (2009) also found that video images support memory and provide a vehicle for memories to resurface. The former students' statements about going back to reconnect and remind themselves of their reasons for being teachers support this memory scaffolding function.

Learning More About Creating Videos

The video project helped students learn more about the technologies for creating videos, which was one of the original reasons for including this project in the course. One of the goals for this project was to facilitate the transfer of this skill from the new teachers to their K-12 students as a curricular activity. However, very few reported incorporating the creation of video projects into their own teaching, which initially disappointed us. Former students who responded to the survey pointed to lack of technical resources and a lack of time given the overwhelming focus on meeting mandated academic content standards.

Other Uses of the Videos

Finally there were some former students who reported showing their videos afterward to others in ways not directly related to their own teaching. One mentioned the use of the video for his job search, one showed her video at a career night to explain what being a teacher is like, and one used the project in a professional development course.

DISCUSSION

Implications for teacher education

The digital video project served as a powerful focus of the technology in the teacher education course taught by the authors. The project itself served multiple functions that extended beyond the scope of the four weeks of the course. Many other technologies were integrated into the course in service of the video project, including blogs in which the students reported on their progress, collaborative cloud environments where students collaboratively published their video projects and links to the projects, and online surveys that students used to evaluate the projects of previous cohorts of students and then later to evaluate the projects of their peers. This authentic use of the technology appears to have had some lasting impact with the students, while other technology uses gained little transfer into their teaching.

While it was disappointing to see through the surveys of the former students years after they took the course that few reported involving their own students in similar digital video projects, it was encouraging to find that these former students reported using other technologies introduced during the course to support the video project. Many former students reported using the blogs they established in the course with their own students and the parents of their students. One of the original goals for the project was for this project to be replicated in the K-12 classroom by the graduates. This transfer did not occur with a high frequency. Many former students reported both perceived and actual hurdles to implementing similar projects in their own classrooms. These hurdles included district pacing guide constraints, educational value of the activity, lack of adequate technology, and lack of instructional time. However, technologies with lower actual and perceived hurdles to implementation have been used by many of the graduates in their own classroom teaching.

One lasting impact reported in the surveys that was not originally expected was the use of the video projects years later by their creators to remind themselves of why they became teachers. This use of the video projects as an artifact for learning is a good example of the ways that creating digital

video projects can serve multiple functions, some extending considerably beyond the space and time of the particular classroom and four week course.

Implications for learning and teaching generally

Much of the previous work with digital video in education has focused on digital stories created by K-12 students. The research described here extends that work in several ways. This research shows the value of creating digital video projects in higher education. It also points out that digital video projects can extend beyond just narrative stories, including other rhetorical types such as arguments, explanations, and descriptions. The ways in which the digital video projects created by university students in this study had multiple functions that extended beyond the space and time of the particular course has implications more generally. Similar digital video projects may have similar impacts in other educational settings, serving to help students become more self-reflective, to communicate with more diverse and authentic audiences, and to serve as artifacts for reminding years later. If digital video projects are viewed as mediators of learning more generally, their effective use for teaching and learning can be expanded to a much more diverse set of learners.

SUMMARY

It is becoming increasingly easy for students to create video projects as part of coursework. But what educational functions are served by having students create multimedia? This study documented a variety of different educational functions that creating digital videos served for teacher education students, including important functions that the course instructors were initially unaware of when they introduced this project into the course. The student-created video projects embodied reflection, which is an important part of the entire teacher preparation process at this university, but the video projects encouraged a different kind of reflection than written reflections. The former students judged these multimedia-based reflections to be powerful for their own learning. The video projects allowed students to communicate with a wide variety of audiences, not just with their instructors as is more typical with other forms of classwork. And some of the educational functions of creating multimedia artifacts, like the function of reminding teachers of why they became teachers, served the project creators years after the projects were created. This study documents the multiple functions that creating short digital video projects served for teacher education students both immediately as they completed their teacher education and later as they served as new teachers.

The research in this paper has described ways that the creation of multimedia by learners can serve as artifacts of learning both by the creator of the multimedia and by others, including other peer learners. These are video projects of the learners, by the learners, and for the learners.

References

Abrahamson, C. E. (1998). Storytelling as a pedagogical tool in higher education. *Education, 118*(3), 440-451.

Adler, S. A. (1990). *The reflective practitioner and the curriculum of teacher education*. Washington DC: ERIC Clearinghouse.

Allen, R. M., & Casbergue, R. M. (2000). Impact of teachers' recall on their effectiveness in mentoring novice teachers: The unexpected prowess of the transitional stage in the continuum from novice to expert. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Bauer, N. J. (1991). *Dewey and Schön: An analysis of reflective thinking.* Washington DC: ERIC Clearinghouse.

Becvar, L. A. (2007). Social impacts of a video blogging system for clinical instruction. *CHI '07 extended abstracts on Human factors in computing systems, CHI EA '07* (pp. 2159–2164). New York, NY, USA: ACM. doi:10.1145/1240866.1240973 .

Becvar, L. A. (2008). *An ethnographic investigation of the evolving dynamics of a learning ecology*. (Unpublished doctoral dissertation). University of California, San Diego, La Jolla, CA. Retrieved from ProQuest http://search.proquest.com/docview/304657365/abstract .

Berliner, D. (1988). *The development of expertise in pedagogy*. Washington DC: AACTE Publications.

Boe, E. E., Cook, L. H., & Sunderland, R. J. (2008). Teacher turnover: Examining exit attrition, teaching area transfer, and school migration. *Exceptional Children, 75*(1), 7-31.

Borko, H., Michalec, P., Timmans, M., & Siddle, J. (1997). Student teaching portfolios: A tool for promoting reflective practice. *Journal of Teacher Education, 48*(5), 345–357.

Campoy, R. W., & Radcliffe, R. (2002). *Reflective decision-making and cognitive development: A descriptive study comparing the reflective levels of pre-service and in-service teachers*. Washington DC: ERIC Clearinghouse.

Center for Digital Storytelling. (2012). Retrieved July 31, 2012, from http://www.storycenter.org .

Cheng, G., & Chau, J. (2009). Digital video for fostering self-reflection in an ePortfolio environment. *Learning, 34*(4), 337-350.

Chi, M. T. H., Glaser, R., & Farr, M. J. (1988). *The nature of expertise.* Hillsdale, NJ: Erlbaum Associates.

Chi, M. T. H., Deleeuw, N., Chiu, M. H., & Lavancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science, 18*(3), 439-477.

Clark, C. M. E. (2001). *Talking shop: Authentic conversation and teacher learning.* New York: Teachers College Press.

Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, Mass: Belknap Press of Harvard University Press.

Connors, R. J. (1981). The rise and fall of the modes of discourse. *College Composition and Communication, 32*(4), 444-455.

Damianakis, T., Crete-Nishihata, M., Smith, K. L., Baecker, R. M., & Marziali, E. (2010). The psychosocial impacts of multimedia biographies on persons with cognitive impairments. *Gerontologist, 50*(1), 23-25.

Danielewicz, J., & NetLibrary Inc. (2001). *Teaching selves identity, pedagogy, and teacher education.* Albany NY: State University of New York Press.

Danielewicz, J. (1998). Inventing themselves as teachers: Prospective teachers talk about theory and practice. *Teacher Education Quarterly, 25*(3), 29-46.

Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan, 76*(8), 597–604.

Dreyfus, S. E. (2004). The five-stage model of adult skill acquisition. Bulletin of Science *Technology and Society, 24*(3), 177-181.

Eden, H. (2002). Getting in on the (inter)action: Exploring affordances for collaborative learning in a context of informed practice. In G. Stahl (Ed.), *Proceedings of the Computer Supported Collaborative Learning* (CSCL 2002) Conference, Boulder, CO.

Etscheidt, S., Curran, C. M., & Sawyer, C. M. (2012). Promoting reflection in teacher preparation programs: A multilevel model. *Teacher Education and Special Education, 35*(1), 7–26.

Feiman-Nemser, S. (2001a). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record, 103*(6), 1013-1055.

Feiman-Nemser, S. (2001b). Helping novices learn to teach: Lessons from an exemplary support teacher. *Journal of Teacher Education, 52(*1), 17-30.

Feiman-Nemser, S. (2003). What new teachers need to learn. *Educational Leadership, 60*(8), 25-29.

Ferraro, J. M. (2000). *Reflective practice and professional development.* Washington DC: ERIC Clearinghouse.

Freese, A. R. (1999). The role of reflection on preservice teachers' development in the context of a professional development school. *Teaching and Teacher Education, 15*(8), 895-909.

Halter, C. (2008). *The Reflective Lens: The effects of digital video analysis on preservice teacher development*. VDM Verlag.

Heo, M. (2009). Digital storytelling: An empirical study of the impact of digital storytelling on pre-service teachers' self-efficacy and dispositions towards educational technology. *Journal of Educational Multimedia and Hypermedia, 18*(4), 405-428.

Heo, M. (2011). Improving technology competency and disposition of beginning pre-service teachers with digital storytelling. *Journal of Educational Multimedia and Hypermedia, 20*(1), 61-81.

Holland, D. (1998). *Identity and agency in cultural worlds.* Cambridge, MA: Harvard University Press.

Hull, G., & Katz, M. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English, 41*(1), 43-81.

Hutchins, E. (1995). *Cognition in the wild.* Cambridge, MA: The MIT Press.

Inman, D., & Marlow, L. (2004). Teacher retention: Why do beginning teachers remain in the profession? *Education, 124*(4), 605-614.

Kenyon, G. M., & Randall, W. L. (1997). *Restorying our lives: Personal growth through autobiographical reflection.* Westport, CT: Praeger.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge England: Cambridge University Press.

Lazarus, E., & Olivero, F. (2009). Videopapers as a tool for reflection on practice in initial teacher education. *Technology, Pedagogy and Education, 18*(3), 255–267.

McLellan, H. (1996). *Situated learning perspectives.* Englewood Cliffs, NJ: Educational Technology Publications.

Moll, L. C. (1990). *Vygotsky and education: Instructional implications and applications of sociohistorical psychology*. Cambridge England: Cambridge University Press.

Nixon, A. S. (2009). Mediating social thought through digital storytelling. *Pedagogies: An International Journal, 4*(1), 63-76.

Nixon, A. S. (2012). Engaging urban youth in critical dialogue on identity through digital storytelling. In J. Avila & J. Pandya (Eds.), *Critical digital literacies as social praxis: Intersections and challenges.* New York: Peter Lang.

Norman, D. A. (1991). Cognitive artifacts. In J. M. Carroll (Ed.), *Designing interaction: Psychology at the human-computer interface* (pp. 17-37). New York: Cambridge University Press.

Osipova, A., Prichard, B., Boardman, A. G., Kiely, M. T., & Carroll, P. E. (2011). Refocusing the lens: Enhancing elementary special education reading instruction through video self-reflection. *Learning Disabilities Research & Practice, 26*(3), 158–171.

Rice, S. M. (2010). Getting our best teachers into disadvantaged schools: Differences in the professional and personal factors attracting more effective and less effective teachers to a school. *Educational Research for Policy and Practice, 9*(3), 177-192.

Schön, D. A. (1987). *Educating the reflective practitioner.* San Francisco: Jossey-Bass Publishers.

Schön, D. A. (1991). *The reflective turn: Case studies in and on educational practice.* New York: Teachers College Press.

Slabon, W. (2009). *Learning by restorying: A naturalistic case study of an instructional strategy in a master's level conflict management course.* Ph.D. dissertation, The Florida State University, United States. Retrieved September 29, 2010, from Dissertations & Theses: A&I. (Publication No. AAT 3399238).

Tripp, T. R., & Rich, P. J. (2012). The influence of video analysis on the process of teacher change. *Teaching and Teacher Education: An International Journal of Research and Studies, 28*(5), 728–739.

Van Es, E. A., & Sherin, M. G. (2002). Learning to notice: Scaffolding new teachers' interpretations of classroom interactions. *Journal of Technology and Teacher Education, 10*(4), 571–596.

Van Manen, M. (1999). The practice of practice. In M. Lang (Ed.), *Changing schools, changing practices: Perspectives on educational reform and teacher professionalism* (Vol. ISER, International Series on Educational Renewal; No. 1, pp. 237). Louvain, Belgium: Garant.

Appendix A: The supports for student video creation

1. Some teacher education students viewed videos created by teacher education students in previous years before their course started.

• Some students viewed on their own some of the "Video spotlight" student videos featured on the Department web page.

• Some students attended the final colloquium presentations of finishing students when they were beginning students and saw the videos in those presentations.

2. On first day of the course:

• The instructors described video storytelling.

• The instructors showed to the whole class two of the current top ten videos created by students in the course during previous years.

• Students in small groups participated in a "Tell me a story" activity.

• Before the 2nd class:

  • Each student posted his/her own story from their previous year's teaching on his/her own blog.

  • Each student viewed and evaluated five of the top ten student videos, using a rubric that was later applied to the students' own videos. The results of this evaluation were used after the class ended to select the top 5 rated videos to retain.

  • Each student read the introductory chapter of the Digital Storytelling Cookbook.

3. On second day of class (two days later)

• Instructors described storyboarding.

• Instructors described resources for the students to use in creating their videos.

• A panel of two alumni from the previous year discussed their videos and their creation.

• Before the 3rd class:

  • Students started creating storyboards and/or scripts for their own videos.

  • Students started collecting photo, video, and music resources for their videos.

  • Students read Chapter 2, 3, & 4 of the Digital Storytelling Cookbook.

  • Each student responded to two other peers' stories on their blogs.

4. On third day of class (5 days later)

• Students gathered in small "critical friends groups" (3 to 4 students) to support the creation of each others' videos, by sharing, commenting, and critiquing storyboards, scripts and ideas.

• Instructors presented more examples of educational uses of video.

• Instructors talked about copyright issues in education.

• Instructors showed how to find resources for videos that had either Creative Commons copyrights or were in the public domain.

• Before the 4th class (2 days later):

  • Each student posted his/her digital video script in his/her blog.

5. On the fourth day of class (2 days later)

• Instructors presented additional tools for sound editing, for screen movie capture, and for video and audio file conversion.

• Before the 5th class (5 days later)

  • Each student responded to at least two other students' script postings.

6. On 5th, 6th and 7th days of class, students had some class lab time to work on their videos.

7. On the eighth day of class

• Instructors presented their research on what students learned by creating video projects.

• Each student uploaded his/her video to YouTube, including license information.

• Each student added his/her video title and URL link to the class list of videos (a Google Doc).

8. On the ninth day of class (2 days later)

• Each student evaluated five other students' videos, using the same template as used the first day to evaluate previous students' videos. These evaluations were used after the class was over to select the top five to add to the Department's video spotlight.

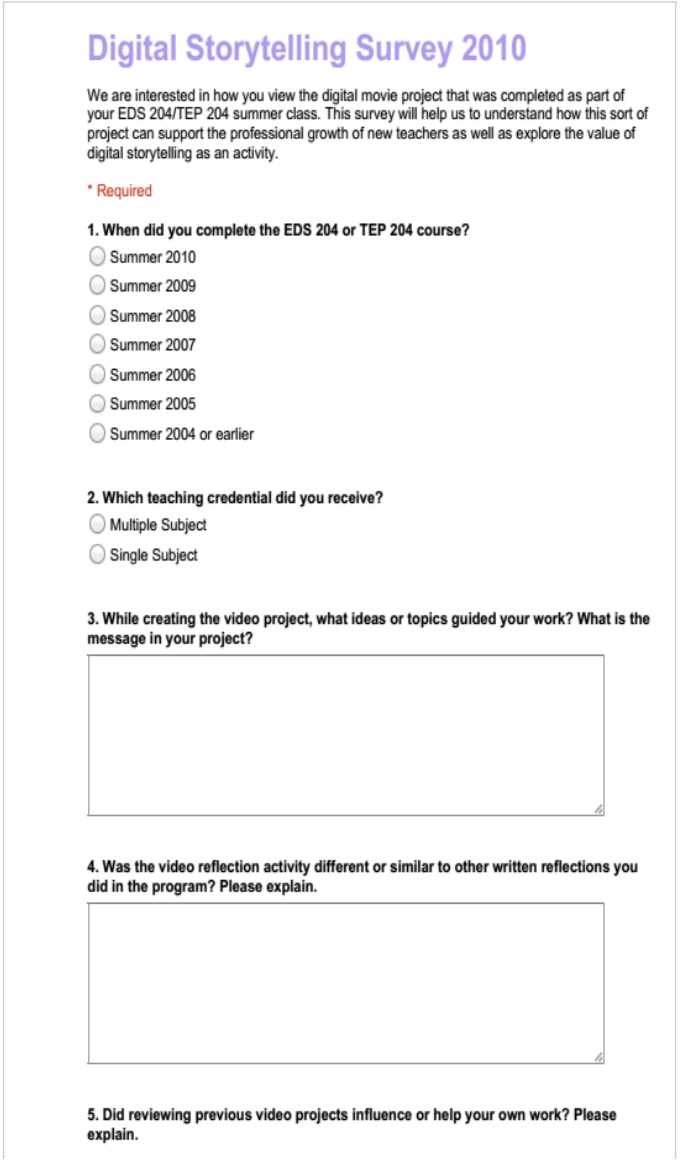
• Each student created a DVD containing his/her video to show at the end-of-program Colloquium.

9. On the tenth day of class (2 days later)

• Each student showed his/her video at the final Colloquium in a small group with three of their peers, a faculty member, parents and friends, and some beginning students.

10. Later in the summer, the former students who created the five top rated videos (based on peer ratings) were contacted by the instructors to ask for their permissions to feature their videos on the Department's video spotlight. If any of these former students deferred, then the student with the next highest rating was contacted. The videos for which the former students gave their permission were added to the home page of the Department's web site, and an announcement was sent to all Departmental faculty and staff, and to the video creators.

Appendix B: The 2010 online survey



Digital Storytelling Survey 2010

We are interested in how you view the digital movie project that was completed as part of your EDS 204/TEP 204 summer class. This survey will help us to understand how this sort of project can support the professional growth of new teachers as well as explore the value of digital storytelling as an activity.

* Required

1. When did you complete the EDS 204 or TEP 204 course?

- ○ Summer 2010
- ○ Summer 2009
- ○ Summer 2008
- ○ Summer 2007
- ○ Summer 2006
- ○ Summer 2005
- ○ Summer 2004 or earlier

2. Which teaching credential did you receive?

- ○ Multiple Subject
- ○ Single Subject

3. While creating the video project, what ideas or topics guided your work? What is the message in your project?

4. Was the video reflection activity different or similar to other written reflections you did in the program? Please explain.

5. Did reviewing previous video projects influence or help your own work? Please explain.

6. Did feedback from peers influence or help your video project? Please explain.

7. Did feedback from course instructors influence or help your video project? Please explain.

8. Since completing the video project, have you gone back to view your movie? Why or why not?

9. What did you learn about yourself from this video project? Please explain.

Consent to Participate *