An Ethnographic Study of Video Data Use in E-Portfolio for Teacher Development

Ruth Xiaoqing Guo

Abstract

This study was aimed at determining how the video data, one of the components in E-portfolio, support teacher candidates' professional growth. A qualitative approach was applied to represent the pre-service teachers' knowledge development and ways of knowing about themselves through their E-portfolios: teaching practices and reflections on their professional development. The data collection focused on video tape recordings of pre-service teachers' microteaching sessions and their reflections, which were parts of their E-portfolios in the teacher education program at a university in Canada. Findings from this study showed that video data provide ways for pre-service teachers to assess themselves better. This approach helped develop their teaching strategies and build their confidence in teaching through practice and reflection.

Key terms: E-Portfolio**,** Pre-service teacher education**,** Ethnographic study**,** Integrating digital video technology into teacher Education**,** Teacher professional development**,** Teacher reflection

Purpose of the Research

This paper focused on the pedagogy of integrating digital technologies into E-portfolios to support student learning in the teacher education program at a university in Canada. Using cognitive learning theory and activity theory as a conceptual framework, the author examined one of the components—video data in E-portfolios as a learning tool to support pre-service teachers' professional development. Digital technologies were integrated into curriculum. Teacher candidates had their microteaching sessions video taped for the purposes of critical reflection on practice. The teacher candidates were encouraged to use these classroom experiences and assignments as artefacts within student E-portfolios as their final projects for the semester. During these processes, the students had opportunities to watch their teaching performances closely and to become aware of the strengths and weaknesses in their performances; therefore it was possible for them to make improvements and recognize their progress in the learning process.

E-Portfolios have attracted wide attention of educators. What is an E-Portfolio? Barrett and Wilkerson (2004) pointed out that the E-Portfolio is a promising framework for enduring learning, self-reflection and construction of value across a student's educational journey. Learners learn by doing, and by constructing knowledge, meaning, ownership and value from the practices of learning. An E-Portfolio is a selection of work put together to show what a student has learned over a period of time. There is a variety of components in the E-Portfolio format. Components include lesson plans, a statement of teaching philosophy, teaching resources, a resume, and reflections on learning and practices. Technologies and new multimedia have provided more opportunities for pre-service teachers to create E-Portfolios for professional development. Video data is one source of invaluable data for critical reflection. The instructor encouraged the teacher candidates to collect their own video data of microteaching sessions, along with other resources, into their E-Portfolios and then burn them to CD or DVD. In order to understand the potential use of video data as a component of E-Portfolio to

support student self-reflection on their own teaching performance, this study focused on the following research questions:

1. Did video recordings help pre-service teachers learn more about themselves?
2. How did pre-service teachers perceive their teaching practices through watching their video tapes of microteaching sessions?
3. Is there any evidence of improvement in pre-service teachers' teaching performances as a result of the inclusion of video data in their E-Portfolios?

Microteaching (e.g. mini lessons), which was evolved by Allen and his group in the sixties in Harvard University to improve the skills of teacher candidates, is an excellent vehicle of providing pre-service teachers with an opportunity to improve their teaching skills. This pedagogy has been employed in the teacher education programs at institutions, including Eastern Washington State College, the University of Southern Mississippi, Brigham Young University, USA, and the University of Hong Kong. However, few have collected video data into E-Portfolios.

Theoretical Framework

The cognitive constructionists (Vygotsky, 1978; Piaget, 1954) suggest that learning is a social practice. A learner learns effectively in any curriculum through the teacher's direct instruction, practicing the skills, self-reflection, and receiving corrective feedback. John Dewy (1938) highly recommends the value of reflection: "To reflect is to look back over what has been done so as to extract the next meanings which are the capital stock for intelligent dealing with further experiences. It is the heart of the intellectual organization and of the disciplined mind."

Ormrod (1999) argued that cognitive processes are the focus of learning. Mental events are central to human learning and they must therefore be integrated into theories of learning. Learning is a process of connecting new information to previously learned information. Previous research on video data in teacher preparation suggested that students know themselves better in the learning process and that makes improvement possible (Guo, 2007). Learning is most likely to happen when an individual can associate new learning with prior knowledge. Barrett and Wilkerson (2004) praise the use of constructivist portfolios because E-portfolio technology offers learners the means to document and reinforce their learning by building their learning experiences in a digital format. "The portfolio is a learning environment in which the learner constructs meaning. It assumes that meaning varies across individuals, over time, and with purpose. The portfolio presents process, a record of the processes associated with learning itself; a summation of individual portfolios would be too complex for normative description" (p. 36). Jurich (2000) agreed that the digital video format enabled students to observe themselves during their classroom practices, get immediate feedback and define the skills they had to improve.

In teacher education, electronic portfolios are becoming widely used due to the prevalence of technological accessibility (Grier, & Denney, 2007). E-Portfolios serve as a model of teachers as learners and as professionals who make meaningful connections to their work. Video data provide individuals with unique opportunities to reflect on their experiences in a tangible manner. Digital Video has become among the top 10 smart technologies for schools. More and more educators realize the educational value of digital video technology and they integrate digital video technology into the conventional curriculum through moviemaking activities. By doing so, students are inspired to engage in creative studies while developing technological and analytical

skills. By using DV technologies, students are empowered with more control over their own learning. If we accept the notion that the best kind of education provides students with a variety of opportunities for analytical thinking, demonstration of new knowledge, and the exhibition of academic achievement, then digital video has a role to play in schools. Even more exciting is the technology's potential to inspire both students and educators to integrate their imaginations and multimedia-rich ways to tell their stories of learning experiences and to examine their professional growth (Holzberg, 2002).

Method

The research site is in the teacher education program in the 2006/2007 academic year at the University of Ottawa in Canada. The Teacher Education classes usually consist of up to 40 students. The data was sourced from five sections of pre-service teachers in Primary/Junior Science and Technology. The student teachers had the option to have their microteaching sessions video taped, but this was not mandatory. About 100 student teachers (half of the 200 pre-service teachers in the five sections in the Science and Technology course) chose to have their microteaching sessions video taped and then made an iMovie of the video for their E-Portfolios. The student teachers were asked to write reflection on each of their two microteaching sessions. The final projects' E-Portfolios, including lesson plan, reflections and iMovie of microteaching sessions were analyzed and measured on how participants in this study facilitated their professional development and became aware of their growth. The students decided which pieces of work to include and how to present their work. Besides choosing pieces of work the student was asked to write a reflection on what he or she learned through completing the work and creating the E-Portfolio.

An ethnographic approach was employed for detailed interpretations of the video tapes and narrative analysis of meta-cognitive reflections, which reviewed students overall meta-cognitive awareness, including a self-assessment of learning and study skills. Evidence of pre-service teacher progress was measured against the constructivist theory underpinning the study. Ethnography is the branch of anthropology in which different cultures are studied and described. Ruby (2005) argues that the ethnographic approach, as the cultural study of pictorial media and as an inclusive anthropology of visual communication, has become increasingly commonplace in training programs and the increasing general acceptance of this approach bodes well for the future in educational research. The video ethnographic approach honors not only the objects of our attention, but mostly the agent, the concrete person with face and name and body that articulates her or his cultural experience and learning process in shareable forms. A major difference between ethnographic and other research approaches is the depth and intimacy of subject under investigation.
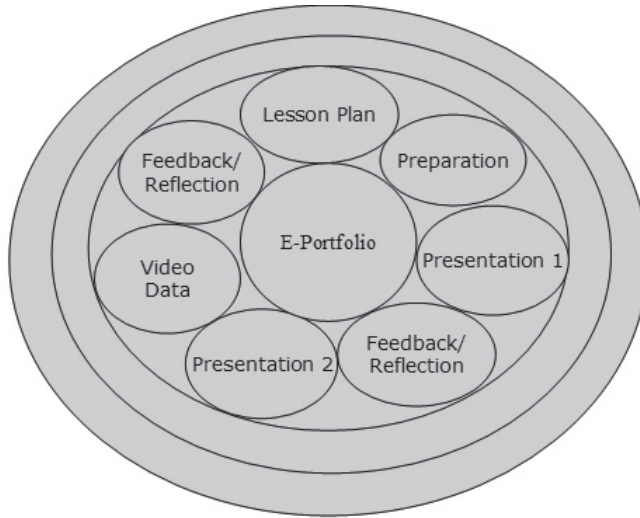
Figure 1: E-Portfolio Components

Students could include any information depending on their needs. Some of them included their resumes if they were ready to pursue a career; some of them collected a lot of teaching resources; others stressed their progress and improvements of their learning process. In addition, they could add more components at anytime if necessary.
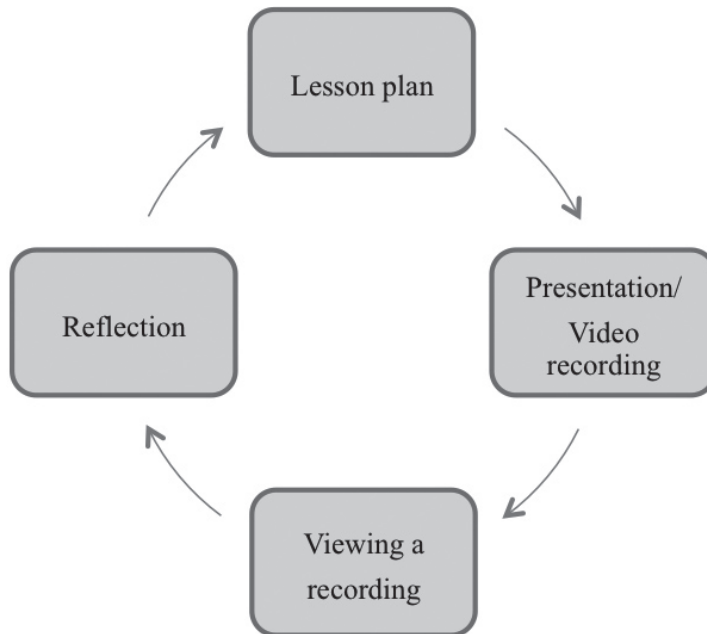
Figure 2: The sequential steps of microteaching

Microteaching is also referred as mini lesson or demonstration. The first demo was designed for group presentations with 6 minutes given for each; the second demo was an individual presentation with 10 minutes. The data collection was carried out in accordance to the sequential steps of the two microteachings with an interval of six weeks apart. The students had the option of whether they would like to put their video data into their E-Portfolios, which they were required to submit as a final project for the course work.

Results and Discussions

The use of digital videos to create a component of an E-Portfolio helped pre-service teachers to reflect on their microteaching sessions and they became aware of their strengths and weaknesses that were otherwise impossible for them to visualize. The pre-service teachers watched each other's video recordings closely and analysed their teaching behaviours and performances.

The research questions were well answered through the analysis of the video data from about 100 pre-service teachers and reflections from pre-service teachers in the five sections of Science and Technology.

Question one: Did video tapes help pre-service teachers learn more about themselves?

Compared with those who did not video tape their teaching practices, the pre-service teachers who did revealed a greater depth of reflections on their teaching performance. Analyses of all videotapes documented the progress the pre-service teachers made in their microteaching sessions. Pre-service teachers made observations of their own microteaching and critiqued their own performances. Typically, they commented that "Video camera doesn't miss anything."

One student teacher revealed how the prepared lesson plan turned out to be different when she presented it: "After watching the video of my microteaching I realized that I understand the concept of hands-on, minds-on authentic learning but do not always incorporate this when I carry out the lesson. During the lesson rather than using volunteers as planned I simply demonstrated the experiment. I became nervous in my surroundings and the lesson reverted to what I was used to teacher--centred learning. This was practical experience as it informed me that the method, while very useful, requires work on not only the part of the students but also on behalf of the teacher." Because the presentation was videotaped and replayed immediately after the class, the presenters, their peers, and the instructor had the opportunity to review and comment on the performances. Upon these reflections, the presenters identified one or two skills that showed that had to be improved.

The video data provided the presenters with opportunities to view themselves with a critical eye. They could reexamine every detail of their presentations, from their appearance to their voice: "During this microteaching I realized that my voice does carry to a crowd and that while sometimes I feel that I do not have control over the situation I appear in control and others are listening to what I have to say. This is apparent in the video when many students asked questions during the experiment and responded when I asked them a question. I feel this has helped me develop a teaching style in science and has allowed me to view myself with a critical eye."

Question two: How did pre-service teachers perceive their teaching practices through watching their videotapes of microteaching sessions?

The pre-service teachers were glad that they had the opportunity to watch themselves. Viewing their own teaching behaviors allowed them to become aware of their strengths and weaknesses and helped them develop professionally (Guo, 2007).

Analysis of video tapes of the pre-service teachers reflected that each of them performed much better in the second microteaching sessions than in the first. Progress was evident according to the E-Portfolio assessments

(Alfano, Zack, Sulzen, and Young, 2007):

- Relating reflections to theory
- Making connections to one's own philosophy of teaching
- Addressing how the pedagogic process has been enhanced

After reviewing her videotapes of two microteaching sessions, a pre-service teacher reflected: "The experiential learning that I gained from this microteaching assignment is valuable as it brings to my attention very important information that will be beneficial to my teaching profession. As in my last microteaching I found some of my learning to be constant such as: students need to be presented with material somewhat relevant to them--something that they can make meaning of so that they learn effectively." The process of recording their presentations, reviewing the recordings, and then reflecting was deemed effective to enhance the presenters' performances and provided opportunities for improving their performances.

Through the microteaching assignment the pre-service teachers felt that they had become more prepared for entering the science classroom at practicum. They were able to identify the areas in which they were weaker. For instance, a teacher candidate reflected: "I have seen from the videos that I am nervous when speaking in front of my peers and by preparing the experiment ahead of time I was able to remain calm and relaxed even when nervous. I also identified my strengths that will be useful for teaching, as I am able to engage with students and my voice is strong and clear for explication and instruction."

Using the video data helped the teacher candidates understand the concept and further aided them in preparing for the next micro-teaching. Each individual teacher candidate planned differently in each individual's approach to the lesson and incorporated the students more in the learning process of the lesson. They created more inquisitive questions that would allow the students to follow their own knowledge of the subject to help others to understand the concepts. For example, some of the teacher candidates applied visual aids to help their students understand the concepts of four seasons; some used audio and music to explain the different sounds made by different animals. Each effort was easily recorded with a video tape and then the video was replayed immediately to see the effect.

Question Three: Is there any evidence of improvement in pre-service teachers' teaching performances through the inclusion of video data in their E-Portfolios?

Almost all pre-service teachers who had their microteaching session video taped found they "made numerous overall improvements" in the second microteaching. Through the lens of a video camera, pre-service teachers had an opportunity to reflect on their performances and therefore to make improvement possible. The pre-service teachers developed an interest in the ethnographic study of their own teaching practices while reflecting and making iMovies of their microteaching sessions. The pre-service teachers applied, analysed and synthesized their teaching subjects and gave evaluation to their own work and their peers. They could easily identify model teaching by viewing their peer video data in the E-Portfolios.

Let's look at an example to see how the students reflected and analyzed their performances by watching their video recordings: "In both the first and second microteaching I felt that I was nervous and the participants could see this, as I was unsure and shaky when asking questions. I found during the first teaching I continually had to check my notes and refocus. After the feedback from the first microteaching and watching the video I concentrated on preparing beforehand and rehearsing the experiment. This helped a lot for the second teaching as I was more prepared and this was apparent as I was less nervous and appeared very calm."

Through the video data, the teacher candidates could see how the concepts in both the learning theories and subject contents addressed in the course interweaved and made their reflections on the hands-on, minds-on, authentic learning possible. They realized that the video data could be very helpful in creating activities that were not only useful to students in the instruction of science but carried over and applied to their daily lives: "…… have developed an understanding for me that science is not only about performing experiments in front of the class. Authentic learning must take place for the students by fully participating in the activity, an activity that will build on deeper more abstract thinking."

The following are some of the student reflections on their own video data:

"In preparing for my microteaching, I made provisions for a class discussion both before and after the experiment (changing the properties of play dough for grade 1 Matter and Materials). I wanted to find out what they knew about properties of play dough before we started, as well as what they thought would happen once we added colour, scent, and texture."

"In my presentation, I believe I asked too many questions, and the discussion was not structured enough. The activity I had devised for the lesson plan would have been successful if applied to a real grade four class. Unfortunately, I did not have time to take our classroom through the activity due to time constraints. In general, I thought I spoke clearly and made good eye contact with the students. It is important to engage the students in each and every activity. For my next microteaching, I will try and prepare a specific set of questions, to guide the presentation in a specific direction. I will also try to speak a bit slower. Although I think I spoke clearly, my nerves did make me rush through my activity. I look forward to using Crockett's comments of misconceptions about science and applying it to my next microteaching."

After the second microteaching, the teacher candidate reported: "For the second lesson I presented a plan for the earth and space systems at the grade two level incorporating the concept of wind. Students used many manipulative to understand the concept of the circulation of air and the creation of wind. Following this activity, students extended the knowledge into their daily lives discovering how wind dries clothing and what dries faster. This knowledge helps distinguish proper dress for certain days and takes science away from the lab and into their lives". Video technology enabled all the process of wind movement recorded with accuracy.

All the teacher candidates who had video data collected agreed that that this has made them be more open to making their lessons well rounded. They were eager to take this knowledge with them into practicum and use it to help themselves and their students learn more in practicum: "During my practicum time I am very interested in the chance to put this knowledge into practice and develop lessons that centre on the learner. I am interested in observing how my practicum teacher uses these techniques and which areas of the theory have been incorporated into her teaching. I'm hoping that I may instill as much knowledge onto them as they will be giving to me, in all I hope that the classroom will allow for the development of learning for everyone involved."

It is obvious that the teacher candidates built their confidence in teaching by watching their progress in the second microteaching. "I thought that my lesson plan went well. The students were engaged and active. I made an effort to include variety in my plan so that the students were not just sitting, listening to the teacher during the teaching portion of the lesson plan. I may have misjudged the timing since it took the full ten minutes with the student-teachers therefore would have taken much longer with a real kindergarten class.   I think I need to work on my timing a little more but I am sure that will come with experience. I would also include more of a language element to this plan if I were doing it with real students. The story gave ample opportunity to do some work on phonics in context.   I think I also would have changed the activities that were to be done at centers but I am not sure how. During the presentation I think I spoke more clearly than my last microteaching and was

feeling much less nervous. I felt much less anxiety about this presentation."

In general, cooperation and sharing of knowledge and information was evident when pre-service teachers were working with a video ethnographic approach. Their knowledge construction had transformed from the application level to the higher levels of analysis, synthesis and evaluation in the second microteaching compared to the first one. The pre-service teachers presented themselves as more professional and more confident and presented their understanding of science curriculum in the second microteaching in a meaningful way. In addition, the presenter of microteaching could focus on one teaching strategy in each session and also was aware of many other skills by watching peers' videotapes of microteaching sessions. At the same time, the pre-service teachers could develop an interest in ethnographic study of their own teaching practices.

Conclusions

Through the study of the video data collected from more than 200 teacher candidates, a pattern was found: the quality of the E-Portfolios increased with the presence of video data. Conclusions that can be drawn from this study:

- The video data played a role in helping the teacher candidates reflect themselves more vividly and subtly;
- Including the video data in the E-Portfolios helped the teacher candidates improve their teaching practices;
- The video data helped the teacher candidates build a connection between a lesson plan and lesson delivery;
- The video data helped the teacher candidates self assess on their lesson delivery;
- The teacher candidates built confidence in teaching by using their video data to analyse their microteaching;
- The video data helped the teacher candidates view their own teaching practices with a critical eye.

Among the advantages of E-Portfolios are the technological capacities to assess student teacher performances and program outcomes through data generated, and student access to and sharing of E-Portfolios among their peers. The participants were involved in all the processes of learning, teaching and research. They viewed the recordings of their presentations with their own critical eye. Findings show that the student teachers have more opportunities to observe their peers' teaching in different subject matters and in different teaching styles. It also created a cooperative learning community and network among the class members.

Teachers could also benefit from the use of E-Portfolios. It could be used professionally as a self-assessment of what has been accomplished within a course or school year. Portfolios were shared with peers, because peers were an important source of creative input and because such sharing promoted collaboration. In addition, video data in E-Portfolios with job-related and authentic purposes will create student motivation and enthusiasm in learning and improving. In addition, more teacher candidates who had E-Portfolios with video data got job offers from the schools because the school hiring committees could assess the candidates' teaching style through the visual access of the video data.

References:

Alfano, M.P., Zack. J., Sulzen. J., & Young, M.F. (2007). *The formative and summative value of electronic*

portfolio assessment. Paper presentation at the Annual Meeting of American Educational Research Association (AERA 2007). April 9 to April 13, Chicago, USA.

Allen, D. & Ryan, K. (1969). *Microteaching.* Menlo Park, California: Addison-Wesley Publishing Company.

Barrett, H.C. & Wilkerson, J. (2004). Conflicting paradigms in electronic portfolio approaches: Choosing an electronic portfolio strategy that matches your conceptual framework. Retrieved July 16, 2007 from http://electronicportfolios.org/systems/paradigms.html

Dewey, J. (1938). *Experience and education.* New York. Macmillan Publishing Company.

Gabler, C. & Schroeder, M. (2003). *Constructivist methods for the secondary classroom.* Boston: Pearson Education, Inc.

Grier, J. M., & Denney, M. K. (2007). *The electronic portfolio as a data source in program assessment.* Paper presentation at the Annual Meeting of American Educational Research Association (AERA 2007). April 9 to April 13, Chicago, USA.

Guo, XQ. R. (22-24 February 2007). *A video ethnographic approach to representing pre-service teachers' microteaching and their professional development.* Paper presented at the 3rd Biennial Provoking Curriculum Conference in Banff, Alberta, Canada.

Jurich, S. (2000). Video technology for teacher training. *Technologies at Work* (42-44). Knowledge Enterprise, Inc. Retrieved in January 26 2009 from world wide web: http://www.TechKnowlogia.org

Machin, D. (2002). *Ethnographic research for media studies.* New York, NY: Oxford University Press. Inc.

Ormrod, J.E. (1999). *Human learning* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.

Piaget, J. (1954). *The construction of reality in the child*. NY: Ballantine Books.

Ruby, J. (2005). The last 20 years of visual anthropology—a critical review. Visual Studies, 20(2), 159-170. Routledge : The Taylor & Francis Group.

Holzberg, C,S. (2002). Top 10 smart technologies for schools: digital video production. Retrieved in October 17 2007 from world wide web: http://www.techlearning.com/db_area/archives/TL/2002/11/topten8.php

Fodeman, D., Kennedy, K., McIntire, T., McLester, S., Ohler, J., Parham, C., Poftak, A., Schrock, K., & Warlick, D. (2002). Top 10 "Smart" Technologies for Schools. *Technology & Learning, 23*(4). 20-36.

Vygotsky, L.S. (1934, 1978). *Mind in society*. Cambridge, MA: Harvard University Press.