JRTE, *42*(1), 73–94

Using Video Editing to Cultivate Novice Teachers' Practice

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Abstract

This article reports research concerning the effective use of video editing to help cultivate novice teachers' reflective practice. The study reported here is part of a larger body of research on video-enhanced teacher reflection. For this study, we used a qualitative research design to examine two guided reflection activities for two groups of novice teachers. The first group debriefed with a teacher educator immediately after teaching their lesson. They later wrote about critical incidents that occurred during their teaching. The second group had no debriefing, but the participants were asked to capture their lessons on digital video, edit their video for two critical incidents, and reflect on the incidents in written form using the same rubric as the first group. Given that both groups used the same reflection guide, we found that students who developed video vignettes produced longer and more multifaceted reflections. We found implications of these results to be an important step towards facilitating novice teachers' development. (Keywords: Digital video editing, teachers' professional development, video reflection)

INTRODUCTION

People learn from their experiences (Boud & Walker, 1990; Kolb, 1984; Shulman, 1987). Think of the experiences a teacher has as being on a dynamic continuum, with each experience affecting the quality of future experiences (Dewey, 1933). Providing these experiences to novice teachers enrolled in their teacher education programs, however, can be difficult due to logistical constraints. In addition, novice teachers bring preexisting educational experiences and beliefs about teaching, learning, children, and culture to their teacher preparation programs. These influences can result in deeply entrenched knowledge about teaching that can be difficult to adjust (Feiman-Nemser, 2001). A major challenge for many teacher educators has thus been connecting the theoretical body of knowledge presented in teacher education programs with this immediate, personal knowledge base that drives novice teachers' decision making while teaching (Korthagen & Kessels, 1999).

Effective reflection has served in the past as a means for novice teachers to restructure prior understandings and refine pedagogical thinking. We agree with many before us that reflection is a necessary component of teachers' professional development (Dewey, 1933; Killion & Todnem, 1991; Schon, 1987;

Schulman; 1987). Research has demonstrated that novice teachers' reflective capability can be cultivated (Hatton & Smith, 1995; Pultorak, 1996), especially if certain conditions are met (Snow, 2001; Yost, Sentner, & Forlenza-Bailey, 2000). For example, novice teachers' ability to develop reflectivity is dependent in part on supervised clinical experiences that address "the beliefs that teachers bring with them to the teacher education program" and that allow the novice teachers to develop their own personally meaningful knowledge base (Yost, Sentner, & Forlenza-Bailey, 2000, p.47). Research has documented a variety of successful methods and media used for providing these types of meaningful, reflective experiences for novice teachers. Some of these include: a) journal writing (Spalding & Wilson, 2002), b) structured microteachings followed by reflective teaching journals (Sparks-Langer, Simmons, Pasch, Colton & Starko, 1990), c) the use of critical incidents (Griffin, 2003), d) multimedia cases (Hewitt, Pedretti, Bencze, Vaillancourt & Yoon, 2003), and e) video (Wang & Hartley, 2003).

We believe that video—specifically digital video editing—is particularly well suited for providing authentic, meaningful, reflective experiences for novice teachers. As Shulman (1987) noted, reflection is a process during which a teacher "looks back at the teaching and learning that has occurred, and reconstructs, reenacts, and/or recaptures the events, the emotions, and the accomplishments. It is that set of processes through which a professional learns from experiences" (p. 19). The flexibility of digital video affords repeated viewing, pausing, annotating, editing, and reorganizing of teaching events that can be used as tools for reflection on teaching (van Es & Sherin, 2002; Wang & Hartley, 2003). These affordances seem to match actions such as looking back, reenacting, and reconstructing. What is more, working with video of their own teaching provides teacher candidates with immediate feedback on their lessons—evidence with an immediacy that is less susceptible to selective memory (Yerrick, Ross, & Molebash, 2005). Let us think for a moment about reconstructing a teaching event through video editing. Accordingly, we believe that video-enhanced reflection can and should be generative in nature. Mayer's theory of generative multimedia learning suggested that a learner can be viewed as a "knowledge constructor who actively selects and constructs pieces of verbal and visual knowledge" in unique ways (p. 4). Mayer (1997) believed that, in accordance with Wittrock's Generative Theory (1974), "meaningful learning occurs when learners select relevant information from what is presented, organize the pieces of information into a coherent mental representation, and integrate the newly constructed representation with others" (p. 4). We feel that novice teachers can edit and reflect upon video clips of their teaching in a manner that could help them make connections between what they need to learn and their prior knowledge about teaching. Similarly, we propose that editing video vignettes of one's own teaching is a constructionist approach to learning in that it "includes, but goes beyond, what Piaget would call 'constructivism.' The word with the v expresses the theory that knowledge is built by the learner, not supplied by the teacher. The word with the n expresses the further idea that this happens especially felicitously when the learner is engaged in the construction of something

external or at least shareable...." (Papert & Harel, 1991, p. 518). That is, people may tend to learn better when they actively participate in activities to create something that is meaningful to themselves and/or to others around them (Papert, 1993; Resnick, 1994). A constructionist approach to learning through video editing thus could provide teachers a motivating context to construct their own meaningful, usable knowledge base about teaching. As emphasized by Sparks-Langer and Colton (1991), "Teachers need opportunities to construct their own narrative context-based meaning from information provided by research, theoretical frameworks, or outside experts" (p. 43). Our research has led us to believe that this reflective process should be collaborative in nature. Our digital video editing process allows novice teachers to externalize the complex, interdependent, and synergistic assembly of factors that inform their actions while teaching so that they can work together with their mentors to analyze and rework them into positive, usable knowledge. The following section describes our five-year research agenda surrounding video-enhanced teacher development.

Toward a Grounded Process Using Video-Enhanced Critical Incident Analysis

Through much iteration of research, design, implementation, and redesign, we have established a process of digital video editing combined with critical incident analysis (Griffin, 2003; Tripp, 1993). Grounded theory and case-study methodology have informed our research. Although each study stands on its own, we view them as one entity constructed through theoretical sampling—a continuation from one to the other, allowing us to go back to the data and forward again to analysis so that we can continue to refine our emerging theoretical framework (Charmaz, 2006). Over the course of our research, we have examined 44 participants (43 preservice teachers and one first-year teacher) as they create 161 critical incidents and produce 144 edited, digital video clips. Data collection procedures have included reflection protocols, digital video, debriefing, and postteaching conferences. The desired outcomes of working through our video-enhanced process have expanded beyond our original measures of teaching behaviors and reflective language into a more holistic, perhaps transformative kind of change. We will explain that in more detail later in this article. In the following paragraphs, we present a brief summary of our research.

In our first study, we investigated how a science education teacher candidate worked with digital video while reflecting on her teaching (Calandra, Brantley-Dias, & Dias, 2006). She was asked to film herself during two separate teaching cycles, edit each cycle for teaching incidents that were meaningful to her, and discuss the edited clips with her cooperating teacher. Data sources included the audiotaped conferences, full videotapes of her teaching, the edited clips, a debriefing session with the participant on her experience using video, and, after reviewing the data, a final interview. We used open coding to analyze our data for themes and used the Framework for Reflective Pedagogical Thinking (Sparks-Langer, Simmons, Pasch, Colton, & Starko, 1990) to identify levels of reflective language. This framework distinguishes among seven types of language and thinking employed by the teacher. These range from "no descriptive language" to "explanations with consideration of ethical, moral, political issues"

(Sparks-Langer, et al., 1990, p. 27). Although the participant's level of reflection was not high during her unguided reflection, she showed remarkably high levels of reflection during a final, video-enhanced interview/stimulated recall session in which she made connections between theory and practice and discussed racial and cultural identity.

In a second study (Calandra, Gurvitch, & Lund, 2008), we worked with seven physical education teacher candidates enrolled in an intensive, four-week secondary methods course. Our purpose was to examine the participants' perspectives of successful teaching through personal video vignettes. We were also interested in how participants' written reflections might change as a result of creating the videos, but with intentionally little external guidance. Three consecutive times throughout their 4-week course, participants were videotaped teaching a 45-minute lesson at a local, urban high school. For each lesson, we asked them to complete the following steps:

1. Describe how the lesson went and determine whether it had been successful or unsuccessful.
2. Identify and briefly describe incidents that supported their overall feeling in Step 1.
3. Create video clips representing those incidents.

Participants did not use a detailed reflection guide. Again, we used the Framework for Reflective Pedagogical Thinking (Sparks-Langer, et al., 1990) to examine the participants' written reflections. Data sources included videotapes of the entire 45-minute lessons, participants' edited vignettes, and participants' written reflections. Results showed that participants generally focused their video vignettes and related written reflections on themselves (rather than their students) and on more technical aspects of their teaching. Initially, the participants thought they created positive vignettes of their teaching. However, upon further reflection, their views of the events changed. We observed some changes in the focus of their written reflections (e.g., from self to students) that may have been caused in part by the video editing process.

In a third study (Fox, Brantley-Dias, & Calandra, 2007), we implemented a more guided process. As part of their field-experience requirements, we asked each of 24 English education teacher candidates to create two digital videos focused on their own teaching. We then asked them to analyze each video through a written reflection. Because the teacher candidates were asked to create the digital videos and written reflections while they were in the field (and not as a part of a course that met regularly), we attempted to scaffold their reflection using a modified version of Tripp's (1993) and Griffin's (2003) steps for reflection on critical incidents in teaching. From this point on, we will refer to the scaffold as the CIR form. Data sources included the edited digital videos, written reflections, and follow-up, open-ended questionnaires. Results showed that the digital video reflection process that the teacher candidates employed helped improve their reflective writing. In addition, use of the CIR form appeared to be essential in enhancing the quality and depth of participants' reflective artifacts.

In a related study, we conducted an action research project with a first-year teacher at her school (Lokey-Vega & Brantley-Dias, 2006). We explored what happens when a first-year Technology teacher uses critical incident analysis and digital video editing while working closely with her mentor. Together the mentor and first-year teacher selected one lesson to videotape, edit, and collaboratively reflect upon. Reports from both participants indicated that using the CIR form along with digital video editing may assist mentors and beginning teachers in having meaningful conversations about lesson implementation, and it may facilitate the mentee's professional development under certain conditions.

At this stage of our research, patterns in the data as a whole pointed toward the importance of two factors in our design: a) The CIR Form and b) video editing. Thus, our next step was to explore what types of reflection occurred when eight preservice teachers of secondary science used the CIR form and digital video without editing (Brantley-Dias, Dias, Frisch, & Rushton, 2008). In this study, each participant videotaped one of their lessons, analyzed the videotape for two to three critical incidents, and wrote a reflection on each using the CIR Form. We then conducted a postteaching interview to elicit participants' comments on the critical incidents and perspectives on learning to teach while reviewing the videotaped lesson. The interviews, however, did not guide participants toward a particular type of reflection. Data sources included written reflections and interviews. Results indicated that participants initially reflected on technical aspects of their teaching. Although the digital video and the scaffolding support provided by the reflective prompts in the CIR assignment were beneficial in helping the preservice teachers identify their strengths and weaknesses, most did not exhibit depth in their written analysis or in their reflective discourse with the researchers.

We designed our CIR form to help teacher candidates examine their videotaped teaching by reflecting on critical incidents of their choosing. They had opportunities to use a variety of reflective lenses during the written reflection as well as during their reflective discourse with the researchers. In most instances, the participants did not reflect across all of the hierarchies. They lacked examination of contextual factors and questioning of their own assumptions as well as imposed policies. This was in contrast to evidence of more robust reflective practices commonly found in studies in which participants annotated or edited their video (e.g., Calandra, et al., 2006; Calandra, et al., 2008; Fox, et al., 2007; Rosaen, Lundberg, Cooper, Fritzen, & Terpstra, 2008; Sherin & van Es, 2005; Yerrick, et al., 2005).

We did not examine students who worked with video alongside those who did not in any of the studies mentioned in this review. Hence, our most recent study became an examination of reflective artifacts from teacher candidates working with and without video but using the CIR form. For this study, we used a qualitative research design to examine two guided reflection activities for two groups of novice teachers. The following question steered our investigation: How can video editing combined with critical incident analysis cultivate more multifaceted reflection among preservice teachers?

METHODS

The current study examined two processes intended to help cultivate reflective ability in a group of novice teachers. We used a modified case study design (Merriam, 1998; Stake, 1995) informed by grounded theory (Charmaz, 2006; Glaser & Strauss, 1967). The units of analysis were two groups of preservice teachers: one group that used video for reflection (VR) and one that did not use video for reflection (NVR). The NVR group debriefed with their university supervisor prior to their reflection. This debriefing was part of the institutional program at the respective university. Due to these contextual issues, we were unable to include a group that did not use video and did not debrief prior to reflection.

Contexts and Participant Selection

The contexts for this study were two teacher education programs located at large state institutions in the southeastern United States that focused on developing new teachers for urban/suburban educational environments. Both provided a variety of field experiences and numerous authentic opportunities for reflection. A population of 54 teacher candidates (24 from a secondary English education program and 21 from a middle-grades language arts and social studies program) were in respective 15-week student-teaching field placement at the time of this study. Because the programs were different in size and degrees awarded (undergraduate vs. graduate), we used a stratified sample to examine the similarities and differences within and across subgroups and the two cases (Kemper, Stringfield & Teelie, 2003). We selected a sample of six teacher candidates (three from each of the respective programs) to participate in the study. Students in the two classes were separately ranked using previous grades on activities and previous practicum experiences. One student in each class was selected from the top third, middle third, and bottom third of these rankings. Students' willingness to participate was a secondary factor in selecting from the three ranked groups. This was done using participants' self-reports and researchers' observations. We also gave attention to students' ages and prior teaching experiences.

We should note here that two of the researchers were also field-experience supervisors for participants. One researcher was the supervisor for three of the students and another researcher was the supervisor for the other three. The six students who participated did so voluntarily and were able to leave the study at any time. The two researchers who supervised the participants were responsible for assigning grades for the students they supervised. A clear boundary existed between the grading procedures and the research procedures. Students were graded based on activities that were outside the bounds of this research. None of the research experiences were evaluated or graded as part of the course credit students received for their student teaching.

A brief description of each participant along with a summary of participant characteristics is provided in Table 1. To protect the identity of the participants, we use pseudonyms in this paper.

Video Reflection (VR) group. Three of the teacher candidates were enrolled in a master's degree alternative teacher education program for secondary English at

Table 1: Participant Characteristics

Group	Participant	Age	Perceived Success	Teaching Experience
VR	Amy	22	Struggling	None
	Akeem	30	Typical	One year on a provisional
	Barbara	24	Exemplary	Informal tutoring
NVR	Ellen	21	Struggling	None
	Cindy	37	Typical	Informal tutoring
	Anne	20	Exemplary	None

a second major university in the Southeast. Amy was a 22-year-old European-American female who was characterized as a struggling student teacher. Akeem was a 30-year-old African-American male who was characterized as a typical or good student teacher. Barbara was a 24-year-old European-American female characterized as an exemplary student teacher.

Nonvideo Reflection (NVR) group. The second three participants were enrolled in an undergraduate teacher education program for middle-grades social studies under the direction of one of the authors of this paper. Ellen was a 21-year-old European-American female who was characterized as a struggling student teacher. Cindy was a 37-year-old European-American female who was characterized as a typical or good student teacher. Anne was a 20-year-old European-American female who was characterized as an exemplary student teacher.

Procedures

VR group. As part of their program, members of the VR group were required to take a technology integration course for teachers. During this course, they learned how to create and edit digital video using iMovie™ software. As part of their field experience requirements, these three participants were then asked to videotape themselves over the course of several lessons. Participants then used a protocol based on a modified version of Tripp's (1993) and Griffin's (2003) steps for reflection on critical incidents in teaching to edit critical incidents from their teaching footage and reflect on them in writing (see Appendix A, p. 91). The participants were expected to illustrate the incidents in detail, describe their emotions and feelings about the incident, explain the incidents from the point of view of all participants (e.g., teacher, student), take a position on their beliefs about the incidents, determine what might be done differently next time, and connect the incidents to portfolio standards on content, teaching performance, cultural relevance, and impact on student learning.

NVR group. Members of the NVR group taught lessons and debriefed with their university teaching supervisor immediately after their lesson. These debriefing sessions focused on areas for growth and improvement. The discussions were emergent and typically focused on specific areas of content and general pedagogical areas most often related to classroom management (students, time, and materials). Following the debriefing, participants in the NVR group used the same critical incident protocol as the VR group, reflect in writing on selected

critical incidents they remembered from their lessons. As with the VR group, participants in the NVR group were expected to describe the incidents in detail, expressing emotions, points of view, beliefs, thoughts about future actions, and connections to standards.

Data Collection and Analysis

The researchers included a panel of two content and pedagogy experts in English education and social studies education, respectively, and two instructional design and technology experts specializing in multimedia learning, cognitive theories of learning, and technology for teachers. Data collection occurred during the spring 2006 semester. Data sources included a total of five video vignettes in combination with five written reflections on critical incidents developed by the VR participants and five written reflections on critical incidents from the NVR participants. There were five sets of reflective artifacts because, in each group, one participant identified only one critical incident, whereas the others in the group identified two each. This provided us with a total of 60 narrative data segments and five video clips. We analyzed the data within and across the two groups. Before analyzing the data, we met multiple times to discuss the trustworthiness and applicability of different measures of reflection—especially with regard to reflective artifacts.

In a fashion similar to our previous studies, we first reviewed participants' writing for levels of reflective language and thinking using the rubric in Appendix B (p. 92; based on Sparks-Langer et al., 1990). We assigned each written segment in the participants' journal entries one of the seven levels of reflective language. For example, if the segment seemed to express explanation of an event with tradition or personal preference as rationale, we assigned the entire segment a "4." During the first round of data analysis, we noticed patterns in the data that the rubric did not satisfactorily address. That is, multiple dimensions of reflective thinking began to appear that were both layered and more complex than the continuum from technical to critical that we had previously used as an analytical lens.

Given this new perspective and based on prior findings, we developed a second, more layered code set for analyzing reflective artifacts using a Multidimensional Model of Reflection on Teaching (Fox, et al. 2007). The multidimensional model illustrates three overlapping lenses:

- Time—reflection in, on, or for action
- Type—technical, contextual, or critical reflection
- Competency—evidence of dispositions, knowledge, or skills

The time lens emerged from prior research on how teacher candidates may reflect *in action* (i.e., in the moment), *on action* (i.e., after the moment), and/or *for action* (i.e., for the future) (Killion & Todnem, 1991; Schon, 1983, 1987). The Type lens is based on Van Manen's (1977) three levels of reflection. It includes *technical* reflection focused on teaching techniques, procedures, knowledge base, or student actions within an event; *contextual* reflection focused on

analysis and/or interpretation of events within a specific context; and *critical* reflections that consist of observations related to issues such as fairness, ethics, equity, power, or social justice. The Competency lens includes *knowledge*, which is concerned with knowledge of content, pedagogy, pedagogical content knowledge, learners (e.g., diversity, development), or context (e.g., classroom environment, school community); *skills* such as planning, the use of instructional strategies and tools, implementation of the curriculum, and communication; and *dispositions* such as attitudes, values, professional beliefs, and habits of thinking such as reflective, action-oriented, inquiry-based, collegial, open-minded, and caring orientations. Two of the researchers coded participants' reflective writing individually using the code set in Appendix C (p. 93). For example, if a written segment seemed to be reflection on action that was technical in nature, the authors assigned the codes 1A and 2A to the written segment. In other words, the time (1) of the reflection was "on action" (A), and the type (2) of reflection was "technical" (B). After individual coding, the two reviewers came together and reconciled any discrepancies. This process involved reviewing each discrepancy in coding and either reconciling the disagreement and assigning a single code or labeling the data unit with a dual code. Less than 10% of the data were dually coded.

Finally, we worked independently using constant comparative analysis (Charmaz, 2006) to identify categories in the written reflections. We then came back together to discuss and refine these initial categories within the data to determine any themes across both groups. Our discussions throughout data analysis provided opportunities for researcher reflexivity (Morrow, 2005)—a time to propose alternative interpretations and question one another's assumptions. This was especially important for the trustworthiness of our analysis, as two of the researchers were program coordinators and field-experience supervisors for the teacher candidates, and two others work in the field of instructional technology. For example, as we reviewed the data, some disagreement emerged about the authenticity of some data that were coded as *reflection in action*. A concern was raised that some of these data may have been reflection on action that emerged as participants watched their videos. To reconcile these differences of opinion, we opted to only code participant comments where the participant directly stated that their reflective thoughts occurred during the act of teaching.

RESULTS

By and large, we found that participants who worked through the video-enhanced reflective process (VR group) tended to write longer and more pedagogically connected reflective pieces than their NVR counterparts, who wrote more about interpersonal relationships and classroom management. We also found that the VR group described transformations in their thinking about teaching, which was less evident in the more technical NVR group writing. Because we analyzed the written data using two frameworks, we present summarized findings from each of the two reviews, followed by patterns we noticed in the data when we used open coding and constant comparative analysis.

Table 2: Range of Levels of Reflective Language Based on First Rubric

Group	Participant	Perceived Success	Range of Reflective Language
VR	Amy	Struggling	Levels 4–7
	Akeem	Typical	Levels 4–6
	Barbara	Exemplary	Levels 4–7
NVR	Ellen	Struggling	Levels 2–4
	Cindy	Typical	Levels 3–4
	Anne	Exemplary	Levels 3–6

Note: See Appendix B for descriptions of each numerical level within the range of coded reflectivity.

Findings Using the Sparks-Langer Rubric

Upon initial review of the data, we noticed that the VR group tended to produce reflections that not only described incidents, but also demonstrated an awareness of what Van Manen (1977) might call practical, contextual, and/or even critical aspects of their teaching. They tended to describe events and explain their decisions using personal preference, principles of teaching, and at times even ethical, moral, and/or political perspectives (Levels 4–7). In addition, they showed evidence of change in perspective about teaching and learning through their reflections. Barbara, in thinking through why she may have had difficulty with her students calling answers out of turn, commented, "I grew up in a very structured classroom environment where students generally followed the strict norm or raising their hands if they wanted to speak (even in response to open questions). However, that norm was not as clearly established in this classroom, and I should have been more culturally sensitive to that fact." She later went on to detail what she might change.

NVR participants wrote shorter reflections that focused more on technical (Van Manen, 1977) aspects of their teaching (i.e., concerns about classroom management). The NVR group generally described what happened during their teaching (Level 2), occasionally using appropriate terminology (Levels 3 and 4). In addition, we noticed that they narrated their written reflections with little attention to student learning, but instead were more focused on teacher and student behavior. A typical observation made by Cindy was: "The A-day group is more talkative; it contains a class clown." She later revisited the thought with the resolution, "Right after class I wrote down the names of students who should not sit together. I created the seating chart based on this information." See Table 2 above for a summary of our numerical coding.

Findings Based on the Multidimensional Code Sheet

Upon a second review of the reflection papers, it became apparent that VR participants transformed their thinking about teaching by using the opportunity to consider pedagogical and contextual dimensions of their teaching experience. For example, the VR group addressed elements of (teaching) knowledge, skills, or dispositions a total of 37 times, compared to the VR group's 16 times. They also reflected on contextual elements of their teaching 12 times, whereas the

Table 3: Frequencies of Each Dimension of Reflection Based on Second Rubric

	NVR			VR		
Dimension of Reflection	Ellen	Cindy	Anne	Amy	Akeem	Barbara
1A: In Action		1	2	3		4
1B: For Action	7	6	7	4	3	13
1C: On Action	2	2	1	4	3	9
2A: Technical	9	4	4	6	1	6
2B: Contextual		3	2	3	1	8
2C: Critical						4
3A: Knowledge	1	2	4	5	3	9
3B: Skills	1	1		1	1	9
3C: Dispositions	2	3	2	3	3	3

NVR group did this only 5 times. In this example, Barbara realized that she may not have made the right decision when noticing a student did not understand her during a lesson: "Although my informal assessment methods helped me realize that [my student] did not understand, I did not act appropriately on the information that my informal assessment provided." She later realized, "Although I was right to anticipate some difficulty, I should have been more sensitive to the cultural differences that might have caused misunderstandings, possibly by providing more background information before assigning the reading."

The NVR group wrote more technical reflections than contextual or critical. The authors also noticed that the focus of these NVR group reflections tended to be on descriptions of interpersonal relationships and classroom management without much explanation or critique. There was comparatively less attention paid to content or pedagogy. In this example, Anne describes two students who like to talk to one another during lessons: "When they get together, all they usually do is talk and mess around." She later revisited the incident: "For this particular incident, I will definitely keep an eye on [Student 1] and [Student 2] to see if they behave themselves." Table 3 presents these findings for all participants.

Findings through Open Coding

Open coding and constant comparative analysis uncovered some noticeable patterns in the data. Participants in the VR group explicitly addressed what we would call pedagogical content knowledge (PCK) far more often than their counterparts. Constructing a personally meaningful knowledge base for teaching is critical to becoming an effective teacher. Pedagogical content knowledge (PCK) is one aspect in which teachers are able to translate their subject matter for teaching into something personal and applicable (Shulman, 1987). According to Magnusson, Krajcik, and Borko (1999), this is the result of the "transformation of knowledge from other domains" (p. 96) such as knowledge and beliefs about subject matter, curriculum, pedagogy, learning context, students,

and their misconceptions (Appleton, 2008). Part of our original purpose was to help novice teachers make meaningful connections to and thus grow their schemata or personal knowledge base regarding teaching and learning. To do this, to a certain extent, knowledge and beliefs need to be transformed. This realization led us to envision differences we saw in participants' thinking as evidence of this type of transformation. We provide some examples from the data, divided by participant group, in the following two subsections.

VR group. Amy's reflections illustrated transformations of knowledge and beliefs about the curriculum, instructional strategies, and her students. Amy began by explaining her use of a "verbal cue" to activate students' prior knowledge of poetry for the upcoming activity and how it caused them to "take notice" and "promoted a greater sense of self-efficacy and self-esteem when they began writing their poems that day." She later discussed the content of a multimedia presentation for her students: "The poems were limited in cultural scope but the concepts presented were not. I could have included more poems from different cultures to … strengthen the students' connection to the texts." She later commented "In the future I will make an effort to incorporate more culturally diverse texts to widen my students' experiences and connections with literature." Not only was she using principle and theory to discuss her presentation, but she was beginning to address issues unique to her students, including cultural diversity. Although Amy initially thought her lesson went well, after editing her video for critical incidents, she noticed: "… In hindsight, I see some egregious errors in my teaching." Amy explains, "Folding my arms across my chest is probably a universal sign of negativity, and that is not what my intention was. I need to be cognizant of my facial expressions and body language when in the classroom and what I am conveying through those."

Barbara also became aware of aspects of her relationship to her students and how that might affect her teaching. As part of her reflection, Barbara expressed concern about how culture influences classroom communication. Upset that her students were "calling out responses to the question all at once," she realized, "The ways in which we communicate are heavily influenced by the cultures we inhabit. I grew up in a very structured classroom environment where students generally followed the strict norm of raising their hands to speak. … However, that norm was not as clearly established in this classroom, and I should have been more culturally sensitive to that fact." Barbara reached a level of critical reflection in her writing by thinking about ways that she could employ culturally relevant pedagogy (Howard, 2003; Ladson-Billings, 1995). She also addressed how she was transformed as a result of recognizing her tendencies and thus adjusting her perspective on the teaching incident.

After her video reflection experience, Barbara also recognized ways in which she could improve her students' understanding of the subject matter. Barbara explained that she used a "modified think-pair-share activity…[for students] to discuss their reactions to a short story" because she was "expecting students to feel confused." However, she had not initially considered why students might find the Flannery O'Conner story difficult to understand. She stated, "In retrospect, I realize that one of the primary reasons that students found the story

difficult was because of its complex religious and cultural content. … I should have been more sensitive to the cultural differences that might have caused misunderstandings, possibly by providing more background information before assigning the reading." She vowed that in the future she would "respond to students' misunderstandings by asking more specific and probing questions to get at the root of the misunderstanding." Barbara's examination of this critical incident increased her understandings of the subject matter, pedagogy, students' misconceptions, and the cultural context of her classroom, thus enabling her to construct PCK about teaching Southern Gothic literature.

In his reflection, Akeem wrote, "Student-centered learning is more authentic; the student's take ownership of their learning. I'm leery of this because of the standardized test that my students take. I think part of the reason I choose to lead the class is because I'm afraid something won't get taught. This time I'm going to give the students the framework of what I expect, a 10- to 20-minute introduction, and the autonomy to put their presentations in motion." In this example, we noticed Akeem transitioning to what LaBoskey (1994) has called a pedagogical thinker, one who differentiates the teacher/learner roles and identifies with teacher as facilitator. We find it important here to point out that Akeem chose to demonstrate his shift in perspective about teaching and learning through his video production. That is, Akeem became not only the facilitator of his students' activities, but he also became the cameraman, shifting the focus of hate video (and incident) entirely on his students. Akeem's *multimodal artifact* (reflective writing combined with the video vignette) indicated a powerful shift of focus that the written piece alone may not have demonstrated. Although edited videos were not originally intended to be a data source, we found Akeem's edited video to be worthy of note and will more closely consider video data in future studies.

Participants in the NVR group showed some pedagogical knowledge, but not nearly as much, nor did they demonstrate the same shift in awareness as their counterparts in the VR group. Their writings tended to be observation and technical descriptions of teacher and/or student behavior.

NVR group. Cindy, for example, wrote: "During my A-day language arts lesson, at least 8 of my 30 students were talking amongst themselves, calling out of turn, or making sarcastic remarks about me." This reflection was quite technical in nature, mostly concerned with classroom management. Her entire reflection paper continues in this vein, with little rationale as to why this situation may have arisen. Cindy did reflect later on how she addressed this issue: "In response to students' behaviors, I created a seating chart." No informed explanation was given for the action, and we found no evidence of transformation as a result of this incident.

Anne described a similar incident: "I grouped desks into fours and assigned each student a group. When the second class period came in, two boys decided they wanted to sit together. When they get together, all they usually do is mess around." Anne went on to describe how she separated the two to keep order in the classroom. Anne later addressed race and culture in another reflective comment: "When I was assigning the particular groups, I was careful not to group

students of the same race together. I wanted to make groups diverse because many of these students do not interact outside of the classroom." She later clarified that this was the reason she separated the two boys mentioned earlier. She went on to say, "As an educator, I do believe that students need to have time to interact with friends and socialize. However, I believe that as a teacher, I need to structure the class so that these interactions are productive. …" Her main concern here was classroom management, and it seemed that the nature of the racial tension she briefly alluded to dropped from the conversation. At no point in the reflection did she address what social, ethical, or moral factors may have caused her and her students' choices, nor did she address how she or they might have changed as a result.

Ellen was similarly technical in her reflections. More than anyone else, Ellen focused on the specific actions and technical procedures of teaching. Interestingly, Ellen chose to focus her reflections on conflicts. In her classroom incident, Ellen describes how, during a lesson, one of her students observed, "You're only calling on white people." Ellen later commented, "I learned that I need to make sure that when doing these things, I keep it diverse. I can't rely on it to just happen; I need to plan for it. For example, today during the game, I made sure that all the team captains from each team weren't only white kids. By doing this, it doesn't look forced or planned. The kids think that's just how it turned out." In this case, Ellen did point out what she might do differently to avoid this kind of awkward situation; however, she did not provide an informed explanation of her actions, nor did she show the same kind of transformation as Barbara when faced with a similar culturally driven classroom incident.

DISCUSSION

In the current study, six preservice teachers at similar stages in their programs wrote narratives about their teaching using the same reflection rubric. We concede that differences in the quality of reflection between groups may have been attributed to a number of factors, such as differences in life experiences, preparation, and content knowledge. Second, we acknowledge that the debriefing protocol may have influenced the NVR group's selection of incidents and ensuing reflective commentary. Finally, there may have been some bias in reviewing the data, as two of the researchers worked very closely with participants but were not necessarily convinced of the effectiveness of video editing, and the second two were very much interested in how video may influence participants' reflections but were not professional teacher educators. It is hoped, however, that bias was kept at a minimum by having all four of the researchers involved in data collection, analysis, and many heated discussions. As evident in our data analysis, we immersed ourselves in the data and repeatedly returned to watch the videos, read the written reflections, and re-examine our coded data. As Morrow (2005) has suggested, these forays into the data led us to a deeper understanding of the data and its interrelated parts, thus off-setting some of the potential bias in analysis and interpretation (p. 256).

Given the limitations listed above, we observed that the NVR group wrote shorter, more technical reflections that focused on aspects of behavior and

classroom management. They also showed little evidence of change in perspective as a result of their experience. The VR group, however, tended to write longer and more multifaceted written reflections than their counterparts. They wrote about not only technical, but also pedagogical and contextual aspects of their teaching. They thought more about how and why certain incidents occurred, and at times they were even critical in their deliberations, all the while making personal connections to theories and methods likely presented in their teacher education programs. How did video reflection facilitate this? The VR group participants wrote reflections not only on the actual teaching incidents, but at times also on the video replay of the incidents. While doing so, they were allowed time to draw from multiple sources of knowledge, including their own, to think about whether or not their teaching decisions made sense. Although this reflection occurred after the actual event, in a way, they were able to stop time and think "in the moment." This is an ability more closely associated with expertise, and it could have been made possible by the affordance of digital video (e.g., stopping, pausing, and rewinding footage of the incident while reflecting). Akeem's use of video caused us to rethink how we envision and evaluate these reflective artifacts. In retrospect, we feel that our participants were perhaps not just reflecting on video clips of themselves teaching, but rather they were creating multimodal reflective narratives. "Meaning is made in ways that is increasingly multimodal—in which written-linguistic modes of meaning are part and parcel of visual, audio, and spatial patterns of meaning" (Cope & Calazantis, 2000, p. 5).

In some cases, the VR participants showed evidence of transformation through their multimodal reflective narratives. Mezirow (1997) explains:

> To become meaningful, learning requires new information to be incorporated by the learner into an already well developed symbolic frame of reference, an active process involving thought, feelings, and disposition. The learner may also have to be helped to transform his or her frame of reference to fully understand the experience. (p. 10)

Some of our past findings have suggested that we initially aimed too low regarding outcomes. That is, we were focusing on improving practice by merely honing a skill set. More recently, we have come to believe that transformation in thinking about teaching must occur before there can be a transformation in practice. We now also think that that this transformation likely includes multiple domains (e.g., more than just cognitive and/or procedural). Korthagen (1993) used the term Gestalt to describe this "dynamic and holistic unity of needs, feelings, values, meanings, and behavioral inclinations triggered by an immediate situation" (Korthagen & Kessels, 1999, p. 9). We believe that a scaffolded process that includes editing video of one's own teaching can help novice teachers work together with their mentors to externalize existing and developing (teaching) Gestalts; more important, the process can aid in the collaborative, positive shaping of them. This process is generative in that participants are encouraged to actively construct meaning through this multimodal process by

adding newly learned experiences and/or information to existing knowledge structures (Wittrock, 1974). This process is constructionist in that they are working together with their mentors on meaning making through the construction of some sort of external artifact (Papert & Harel, 1991). This process is multimodal in that novice teachers are processing information through more than one modality (Mayer, 1997, 2005; New London Group, 2000). Future studies should examine these theoretical underpinnings as we hone our approach to using video editing to help novice teachers develop in positive ways.

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APPENDIX A

Critical Incident Reflection Form (Authors, 2006)

What are critical incidents?

Critical incidents are the "oops," "ouch," "aha…," or "oh…" moments that you experience during a teaching episode or as you watch your videotaped lesson. The incident may be something that "amused" or "annoyed," was "typical" or "atypical," or a "felt difficulty" or "felt success."

Why use critical incidents?

One goal of using critical incidents is to help you look beyond the experience of the incident to the meaning of the incident. This is a form of reflection-on-action. Another goal is to help you develop your ability to reflect on these incidents as they happen, or reflection-in-action. Finally, using critical incidents can help you adjust your lesson and strategies for future teaching cycles, or reflection-for-action.

How do I reflect on the critical incidents that I select?

Remember, there is no "right" or "wrong" way to select an incident. It should be something useful and meaningful to you. After watching and editing your videotaped lesson for critical incidents, use the statements and questions below to guide you as you reflect about the two to three critical incidents that you selected.

What

Provide an in-depth description of the event. Try to write this without judgment or interpretation.

Emotions

Describe the feelings you had as you "experienced" the incident.

Why

Explain the incident from the perspective of each participant (student, teacher, etc.). Use "I" for each participant's explanation.

Portfolio Standards

Which of the portfolio standards from content knowledge, teaching performance, and impact on student learning are addressed in this incident?

Cultural Relevance

In what ways did you employ culturally relevant teaching (for example, communicating high expectations for all students; using cultural referents for imparting knowledge, skills, and attitudes; creating a learning environment that honors and promotes cultural diversity; helping students challenge the status quo)? You might begin with, "As an educator, I was/was not able to…"

Position

What are some of your personal beliefs related to teaching and learning that you identified when reflecting on this incident and the portfolio standards that you addressed. You might begin with "As an educator, I believe/value…"

Actions

After considering this incident, what will you do differently in the next lesson in light of your new understandings? You might begin with, "As an educator, I will…"

APPENDIX B

Rubric for Levels of Reflective Language and Thinking (Authors, 2006)

Level	Description
1	*No descriptive language*
2	*Simple, layperson description* ("I use groups.")
3	*Events labeled with appropriate terms* ("I tried peer-response groups in writing workshop.")
4	*Explanation with tradition or personal preference given as the rationale* ("I always use peer-response groups for a longer writing assignment because I like how we did that in class in this program.")
5	*Explanation with principle or theory and consideration given as rationale* ("Peer-response groups help students get out of the proofreading/correcting mode and help them focus on revising their whole paper so they can continue writing and make the whole paper better.")
6	*Explanation with principle/theory and consideration of context factors* ("I think the peer-response groups are useful in this class because the students in my school are not used to working together in groups, and I want to teach them how to do this.")
7	*Explanation with consideration of ethical, moral, political issues* ("Because these students tend to segregate themselves in groups by gender, I think the peer-response groups will help them learn to accept and value each other's perspectives.")

Note 1: Each written segment was assigned one of the levels above, so if it seemed to be an explanation of an event with tradition or personal preference as rationale, we assigned the entire segment a "4".

Note 2: Adapted from Sparks-Langer et al. (1991)

APPENDIX C

Coding Framework for Second Round of Analysis

1. Time in which reflection occurred
    - A. in action
    - B. on action
    - C. for action

2. Type of reflection
    - A. technical
    - B. contextual
    - C. critical

3. Competency discussed
    A. knowledge
    B. skills
    C. dispositions

Note: If a written segment seemed to be reflection on action that was technical in nature, the authors assigned the codes 1A and 2A to the written segment. In other words, the time (1) of the reflection was "on action" (A), and the type (2) of reflection was "technical" (B). After individual coding, the two reviewers came together and reconciled any discrepancies.