Developing Reflective Thought in Preservice Educators: Utilizing Role-Plays and Digital Video

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This study was designed to investigate the role of video in the growth of written reflective responses between two groups of preservice teachers. Fifty-four students enrolled in four sections of a required special education course that focused on family-professional collaboration participated. Subjects included candidates seeking general and special education certification and a teaching endorsement in special education. Participants were divided into two groups. Group 1 students participated in three role-plays, reflected on their actions, and then wrote reflections after each role-play. Group 2 students participated in three role-plays that were recorded with digital videotape and placed on a streaming server. Students watched each video, reflected on their actions, and then wrote reflections. A developmental coding rubric was used to score students' written reflections following the role-plays. Analysis of the written responses and follow-up focus discussions demonstrated an increase in reflective thought in the written reflections of the students who used video. Findings also showed positive attitudes about the use of technology for personal reflection. Implications for future practice and the use of digital video technologies are discussed.

In a special education course focused on collaboration between professionals and diverse families, an instructor at a college of education in the Pacific Northwest was utilizing role-plays as an instructional method to increase students' communication and collaboration skills. The class was required for all students, both elementary and special education teacher candidates, seeking a special education endorsement. Historically, role-plays with a reflective writing component were the primary instructional tool. Following the role-plays, students participated in informal, guided written reflection activities designed to increase their awareness of their collaboration strengths and weaknesses. After teaching the course numerous times, concern arose over the lack of depth in the written reflection pieces. In an effort to increase the quality of effective communication and collaboration skills, methods were sought to further develop the quality of the students' reflective thought. Investigating the use of video as a tool to develop reflective thought of preservice educators came to mind.

Theoretical Framework

Historical Perspective

For nearly a century, the importance of reflective practice as an effective teacher skill has been documented throughout the educational literature. Dewey (1933), credited with the first discussions on reflective practice, considered reflection as the core of all learning experiences, which enable "us to act in a deliberate and intentional fashion ... [to] convert action that is merely ... blind and impulsive into intelligent action" (1933, p. 212). Dewey viewed reflection as an important characteristic of an effective teacher, and his work became the foundation for subsequent investigations into reflective practice. For example, van Manen (1977) used Dewey's steps of reflection as a base and conceptualized reflection as a cycle of problem solving with three distinct levels of thought: technical, practical, and critical reflection. Schön (1987) realized Dewey's conceptualization of reflection lacked a
temporal dimension and suggested two types of reflection, reflection-in-action (reflecting in the moment) and reflection-on-action (thinking after the action). MacKinnon (1987), also considering reflection as a cyclical process, investigated the manner in which students made sense of their performance in teaching settings. He suggested that reflection is a cycle incorporating problem setting, reframing, and resolution.

As current general and special educational reform efforts unfold, standards-based assessment practices continue to top the national education agenda. Preservice, novice, and expert teachers are encouraged and, in some cases, mandated to engage in reflection and reflective practices. For example, some states have included reflective practice as a part of No Child Left Behind's (NCLB) definition of "highly qualified teacher" (New Jersey Department of Education, 2000; Wayne County Regional Educational Service Agency, 2004). As a further example, the National Board Certification organization has incorporated reflection and reflective practice into assessment and evaluation outcomes of teachers who are seeking National Board Certification. Thus, proposition four of the National Board for Professional Teaching Standards (NBPTS), "Teachers Think Systematically About Their Practice and Learn from Experience," states that effective teachers "reflect on their teaching in order that they might improve their practice" (National Board for Professional Teaching Standards, 2006). Such expectations and mandates are presumably based on the assumption that reflective teachers can change student outcomes.

Despite the extensive literature base on reflection and reflective practice, the majority of work advocating the use of reflection is highly theoretical and philosophical. A distinct feature of the literature is the varied interpretation of reflection skills and subskills (Canning, 1991; Costa & Kallick, 2000; Egenberger, 2002). Most literature, however, supports reflection as an aspect of thinking about one's thinking. For teachers, reflection occurs when they think about their teacher actions.

Many view reflection as a vehicle teachers use to make meaning of the daily complex task of teaching. For example, Costa and Kallick (2000) suggested that reflective teachers construct meaning from their work by monitoring, analyzing, and modifying their behaviors according to underlying values and consequences of their actions. Reflective teachers use reflective practices to integrate theory and practice in an effort to understand the complexity and uncertainty of teaching (Killion & Tondem, 1991; Lucas, 1999). As Egenberger (2002) suggested, reflective teachers engage in a cycle of metacognitive problem-solving behaviors to bridge the gulf between theory and practice.

The complex task of teaching involves many aspects other than instruction, especially, for special education teachers. For example, they are required to demonstrate ongoing collaboration skills with family members and support professionals such as therapists, community members, and agencies. The strength of these collaborative relationships often determines the success of a child's educational program (Sileo & Prater, 1998; Turnbull, Turnbull, Erwin, & Soodak, 2006). Reflective special education teachers can use reflective practices to understand the complexity of these collaborative relationships. That is, they can use reflection as a metacognitive problem-solving process to maintain effective collaborative partnerships to support student achievement (Egenberger, 2002).

While many support the idea of reflection as a problem-solving, meaning-making process, the specific skills of reflection are not clearly defined. Specific instructional and assessment strategies used to develop reflection are also absent from the literature.

The use of video as a tool for reflecting on one's actions is not new (Hatton & Smith, 1995; Sparks-Langer & Colton, 1991). The primary goal of using video is to provide candidates data of their actual performance, the substance of reflective practice. Video provides an opportunity for teacher candidates to distance themselves from the situation and review their performance without focusing on those aspects of the event that may serve as distracters during the actual experience (Hatton & Smith, 1995). Video data provide an accurate historical record that is trustworthy, unlike an individual's memory that is often selective in recall.

While video is an effective tool for aiding the reflection process, evidence of one's reflectivity is not easily documented. A task analysis of performance outcomes or specific subskills associated with reflection is not clearly evident in the literature. Some define reflection as a skill, but do not include any specific subskills. Many conceptualize reflection as a multifaceted set of behaviors (Egenberger, 2002) that "involves active, persistent, and
careful consideration of any belief or practice in light of the grounds that support it and the further consequences to which it leads” (Grant & Zeichner, 1984, p. 4). Because reflective behaviors are difficult to operationalize, as noted by Schön (1987) in his description of reflection-in-action, most evidence of reflective behaviors is documented through written works such as journals and essays (Hatton & Smith, 1995; Lee, 2000). For example, individuals engage in “teaching behaviors,” reflect upon those behaviors, and then write a reflection in a journal or essay format. Thus, the reflective nature of the teacher becomes evident in the journal or essay.

Basic content knowledge and pedagogy are accepted entities, and assessment practices for measuring teacher candidates’ growth in these areas are well established, as indicated by professional standards and certification requirements (Conference Board of the Mathematical Sciences, 2001) (see organizations such as National Council of Teachers of Mathematics and National Science Teachers Association). Instructional methods for teaching reflective skills and assessment practices for measuring those skills are not clearly articulated, however. While video is considered an important tool for delivering content and pedagogical knowledge as well as assessing that knowledge, less is known about the impact of video in developing and measuring reflective thought.

Research Questions

The quarter prior to the implementation of video within the instructional program, researchers designed a study to investigate the role of video in developing and measuring reflective thought of special education teacher candidates. The study was based on the Collaboration for the Improvement of Teacher Education (CITE) framework for reflective thinking (Sparks-Langer, Simmons, Pasch, Colton, & Starko, 1990). A conceptual framework drawing on theoretical aspects from reflective practice and technology, as embedded within the well-established context of teacher preparation, served as a basis for this study. The following questions were developed from this conceptual framework:

1. Do students who write reflections after reviewing a video-recorded role-play in which they participated show a measurable difference in the quality of written reflections over time?

2. Is there a difference in the levels of written reflections between students who write reflections after reviewing a video-recorded role-play and students who write reflections after a role-play without reviewing video?

The researchers anticipated that students who reviewed themselves on video would show significant growth in reflective writing across three role-plays. The researchers also anticipated that there would be an observable difference in the levels of reflective thought between those who utilized video recorded role-plays and those who did not.

Methods

Setting and Participants

The investigation took place at a regional public university in the Pacific Northwest. Fifty-four students enrolled in four sections of an undergraduate course entitled Families, Professionals, and Exceptionalities were selected for the study. The course was a 10-week (quarter long), four-credit requirement for special education majors and those seeking a teaching certificate and endorsement in special education. Students were organized into three- or four-member groups or “families” on the first day of the course, and the group structures remained constant throughout the quarter. Each family group was assigned a letter name such as Family Group A or Family Group B.

All participants were in their third or fourth year of their special education program, and members of each group had a similar range of experiences in working with families prior to taking the course. Experiences with families ranged from no experience to daily experience, such as a student who worked as a family service coordinator at a local family support center. All students participated in class discussions, reflective writing, and the same number of role-play opportunities.

Two sections of students did not utilize video prior to writing their reflections. Reflections from these 26 students were combined into Group 1. The other two sections, 28 participants, formed Group 2; they utilized video. Other than the use of video-recorded role-plays, the groups were comparable in terms of student variables and type of instruction delivered.
Activities and Data Collection

Role-Play Requirements

All students from both groups participated in three formal role-plays during the study. Every student also participated in an additional initial practice role-play that was not videotaped or included in the analyses. The contexts of the role-plays included an introductory meeting, parent-teacher conference, special education referral meeting, and an individual education program (IEP) planning meeting.

The students participated in two role-plays during each role-play session. In one role-play, they participated as the “professionals;” in the other, they participated as a “family.” All aspects of the “families”—such as family members, family member characteristics, and family needs and strengths—were developed by the students; no scripts or case studies were used. The focus of the course, the role-plays, and the reflections, was professional collaboration. The students’ collaboration skills as professionals were analyzed, not their skills as family members.

All students were given a schedule of the role-plays as an advance organizer. This schedule included the role-play dates and collaboration topics. The collaborative skills addressed in each role-play were cumulative, beginning with effective listening skills and ending with effective communication, family diversity, meetings, paraprofessional collaboration, and problem solving. Students, as professionals, were responsible for demonstrating effective communication and collaboration skills within each role-play. Collaboration content and skills were based on Turnbull and Turnbull’s (2001) Empowerment Framework: Collaborating for Empowerment model. The duration of the role-plays increased progressively with each role-play. The first role-play in which the “professionals” initially met the “family” lasted approximately five minutes. The last role-play, in which the “professionals” collaborated with the family about the child’s instructional program, lasted approximately 15 minutes.

Written Reflections and the Reflective Structure

For both groups, written reflections were collected from each student prior to subsequent role-plays. Role-Play 1 occurred during week five, Role-Play 2 during week seven, and Role-Play 3 occurred during week nine of the quarter. Students in both groups completed their written reflections before participating in the next role-play. Some variability occurred between the groups in terms of the length of time between role-play participation and writing reflections. For example, students in Group 1 participated in a role-play and then wrote reflections, which were turned in during the next class meeting. The time between role-plays and writing reflections was short because the students were relying on their memory of the role-play. Students in Group 2 participated in a role-play, watched their video-recorded role-play, and were required to turn in the reflection prior to the subsequent role-play. Variability in technical assistance resulted in time delays between role-plays and video postings. This delay prohibited students from turning in reflections by the next class meeting. However, they were required to turn in their reflections the class period after the reflections were made available. Therefore, even though more time had elapsed between participation in the role-play and the writing of the reflection, Group 2, did not necessarily get more time to write the reflections.

Slight variations existed in the directions for the role-plays. For both groups, the instructor collected the reflections, but did not assign a grade. When students in Group 1 completed their reflections, the instructor had not yet decided to conduct a formal study, and a large percentage of the turned in reflections did not contain student names. Students in Group 2, on the other hand, were explicitly asked to include their name on each reflection.

Group 1 was given the following verbal prompts prior to writing the reflections:

1. Identify the content for the role-play. Think about what you have learned in class.

2. Reflect on your actions on the role-play

3. Target a goal for the next role-play.

Because Group 2 students utilized video and would be writing reflections at a time unknown to the instructor, the instructor generated written responses as a reminder. The following were the written prompts to guide students’ reflection (Kolb, 1984; van Manen, 1977):
1. Identify the content for the role-play. Review the information in the text.

2. Identify (write down) your actions, what you saw on the video, related to the content identified in #1.

3. Reflect on the relationship between what you saw on tape and what you read in the text.

4. Target a goal for the next role-play.

For Videos 2 and 3, students were told to reflect on their goal from the previous reflection and continue with steps 1 through 4. Other than the initial 15-minute demonstration of the use of video and the prompts, students in Group 2 received no additional instruction on video or reflection.

**Use of Streaming Video**

The instructor utilized Blackboard throughout each course. Documents such as PowerPoints, course activities, and activity directions were included on Blackboard, which was also used by the instructor to send emails, post announcements, and record grades. The purposes of using streaming video were twofold. First, the instructor wanted to make the videos accessible to all the students at any time they chose to reflect on the video. Because the students were already using Blackboard for other course assignments, the instructor thought that placing the videos on Blackboard would allow the students maximum opportunity for reviewing the video. Second, the instructor wanted to be able to use the video during class time.

To make the video available on Blackboard, each role-play was recorded using a digital video recorder. The video recordings were simple. A camera was mounted on a tripod and students positioned themselves so that they each were clearly visible in the recording. A table microphone was used to capture the audio. The instructor pushed record and stop between each role-play. Upon conclusion of each set of role-plays, the digital videotape was given to a graduate student, who was responsible for rendering the video and placing it on a streaming server. A link was created from the instructor’s Blackboard site to each video and students were instructed to review the video prior to the next class. Each video was reviewed prior to subsequent role-plays. The turnaround time for placement of the video on the server ranged from several days to more than a week.

**Unsolicited Feedback**

Additional descriptive information was obtained from unsolicited emails received by the instructor the quarters that video was used. This student feedback was saved and used to provide insight into the findings and future implications.

**Data Analysis**

**Instrumentation**

A scoring rubric based on the work of Sparks-Langer and Colton (1991) and others (Hatton & Smith, 1995; Morin & Conderman, 2003) was developed to analyze the written reflections (see Table 1). Two previously validated scales provided an initial framework. These included a scale that had been used to code reflective thought in interviews (Sparks-Langer & Colton, 1991) and another that was utilized to code types of reflective thought in on-line dialogue (Morin & Conderman, 2003). The researchers reviewed both of these rubrics to determine suitability for coding written reflections, but found that they were not easily applied to reflections written in essay or paragraph format.

The coding rubric contained eight categories of reflective written responses: goal statements, which are not considered reflective thought and rated as a “0”; statements of facts, rules, or skills, “1”; descriptive writing, “2”; technical rationality, “3”; descriptive reflection, “4”; dialogic reflection, “5”; critical reflection, “6”; and reflect-on-action, “7”. Hatton and Smith (1995) described two higher levels of reflective thought not included within the framework, Contextualization of Multiple Viewpoints, and Reflection in Action. Both of these levels can only be demonstrated within the context of an actual teaching/professional experience. As the subjects were teacher candidates and not practicing professionals, these two categories were omitted in the coding rubric (but would have been included in any coding of reflections written by inservice educators).
Table 1

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of Reflective Thought</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>Statement of future participation in follow-up role-plays</td>
<td>For the next role-play I will focus on using a quiet voice.</td>
</tr>
<tr>
<td>1</td>
<td>None</td>
<td>Statement of fact or skill; No observation</td>
<td>My job was to include whole messages. I tried to remember the reliable alliances.</td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>Descriptive writing: Must be observed</td>
<td>The family we worked with was a wife (shy) and husband (domineering).</td>
</tr>
<tr>
<td>3</td>
<td>Technical Rationality</td>
<td>Description of observed event with terminology</td>
<td>I did look like I was interested in what the person was saying. I was using good body language.</td>
</tr>
<tr>
<td>4</td>
<td>Descriptive Rationality</td>
<td>Description of an observed event with associated terminology and personal perspective; looks at impact on others</td>
<td>I did a good job of smiling and nodding while the family was talking, which I think helps encourage continuing conversation.</td>
</tr>
<tr>
<td>5</td>
<td>Dialogic Reflection</td>
<td>Description of an observed event with associated terminology/concepts; Uses multiple perspectives</td>
<td>None of my group, or myself, actually validated the family’s feelings.</td>
</tr>
<tr>
<td>6</td>
<td>Critical Reflection</td>
<td>Considers entire context; Discourse with self and explores possible reasons for actions. Steps out of self and observes from a distance</td>
<td>I realize that I tend to put my hand down on the table or other object when I feel strongly about a topic. I am not sure if this is a nervous habit. I wonder how others view this action? I wonder if people view me as harsh?</td>
</tr>
<tr>
<td>7</td>
<td>Reflect-on-Action</td>
<td>Ethical and moral issues; Considers a holistic picture and considers implications for future practice (outside of a role-play)</td>
<td>Making a strong statement may cause families to feel uncomfortable...the last thing I want to do is offend a family... I am glad that I have become aware of this action because I can figure out new ways to use my hand when I am making a point in a discussion.</td>
</tr>
</tbody>
</table>

Quantitative Analysis

Using an analysis format supported by Hatton and Smith (1995), a sentence-by-sentence analysis was conducted for each role-play reflection from both groups. First, each sentence in the reflection was copied into an Excel spreadsheet. Each sentence was then scored based on a scale of 1-7, or identified as a goal statement (0), using the aforementioned rubric (see Table 1). A score of 1 indicated the lowest level (or lack of) reflective thought. A sentence rated as 7 indicated the highest level of reflective thought. Specific goal statements and goals for the subsequent role-play were labeled as “goals” and received a score of (0). Sentence statements that indicated a goal for future practice in an authentic setting, such as a school, were coded with a 5, 6, or 7. The following is an example of a goal for future practice that indicates higher reflectivity skills according to the rubric, with scoring enclosed in brackets:

In the future I want to be a more effective listener [0]. I plan on doing this by intending to listen rather than pretending to listen [0]. I will also continue practicing verbal listening skills, such as paraphrasing, questioning, and validating [0]. By using these skills, I will communicate to the speaker that I am interested in what he/she has to say and that I value his/her thoughts [6].

—Reflective comments of C.R., 01/04
The last statement received a score of 6 because it indicates critical reflection. The student's thoughts reflect beyond the current role-play and explore possible future actions that will impact others.

Reliability within the coding system was verified using a two-step process. First, prior to analyzing the written reflections, the researchers (N=2) practiced coding reflections. Ten data samples and a list of codes were given to each researcher, who coded the data. Results from each researcher were then compared. The researchers practiced scoring lines of data until interrater reliability was high, ranging from 75% to 100% with a mean of 89%.

Upon establishing interrater reliability, each role-play was individually analyzed by both researchers, and results were compared. A total of 1,806 lines of data were scored individually by both researchers. After each researcher scored the data, scores were compared. Discrepancies between 373 lines, or 20% of data, were observed. The lines were re-examined by the researchers, and scores for these lines were negotiated until agreement on each score was reached. Once all the role-plays were coded, the researchers consolidated all the like scores and reanalyzed the data to verify the consistencies in rankings. Approximately 25 discrepant lines of data were noted, negotiated, and then recoded.

Results

Analyzing Reflective Scores

Because the groups were intact groups, a quasi-experimental, time-series design (Campbell & Stanley, 1963) was selected to investigate the effectiveness of the video intervention. Two designs and separate analyses were used, one to answer each research question.

Research Question 1. To answer Question 1, Do students who write reflections after reviewing a video recorded role-play in which they participated show a measurable difference in the quality of written reflections over time?, data from Group 2 were analyzed using a repeated measures ANOVA.

For Group 2, an overall "reflective score" for each student completing each role-play reflection (Role-Plays 1, 2, and 3) was calculated with a weighted mean. This was computed by taking a frequency count for each reflective level (Goal, 1-7) for each student on each role-play. For example, every statement from each written reflection was scored with a 1-7, or a 0 for a goal statement, and sorted. The frequency of each score was determined and converted to percentages. The percentages were then multiplied by the corresponding level, weighting the frequencies. Students who did not complete all three role-play reflections were removed from the group, leaving n=23. Weighted means were compared using a repeated-measures ANOVA with a Tukey's HSD (honestly significant difference) post hoc analysis.

A significant difference was found between the means of the reflections from the three role-plays, F(2,22) = 22.72, p<.001, MSE=.336. Inspection of the means revealed that, consistent with the research hypothesis, reflective thought increased across the three role-plays (see Tables 2 and 3). The post hoc analysis using Tukey's HSD test indicated significant differences (p < .01) between Role-Play 1 (M = 2.51, SD = .73) and Role-Play 3 (M = 3.62, SD = .50) and Role-Play 2 (M = 2.79, SD = .51) and Role-Play 3 (M = 3.62, SD = .50), supporting the hypothesis that reviewing videos improved the quality of reflections. Although there was not a significant increase between Role-Play 1 and Role-Play 2, the direction of the mean was positive, further supporting the initial hypothesis.

Research Question 2. Answering the second question, Is there a difference in the growth of written reflections between those students who write reflections after reviewing a video recorded role-play compared to students who write reflections after a role-play without reviewing video?, presented the researchers with a small challenge.

As stated under Methods, the instructor had retained copies of the written reflections from participants in Group 1, but did not have names on all the assigned writings. Because the researchers were unable to match each student's reflections, a repeated-measures ANOVA could not be calculated. However, the researchers did want some quantitative comparison, not just a case study, and the course instructor was unwilling to give up the use of video for future courses. Therefore, the researchers opted to code all the written reflections for each role-play as a group and then utilize a simple t-test. The findings indicated that no significant differences existed between Role-Play 1 and Role-Play 3 existed, or between Role-Play 2 and Role-Play 3. However, this finding alone
Table 2

Source Table for Weighted Means from Group 2

<table>
<thead>
<tr>
<th></th>
<th>Role-Play 1</th>
<th>Role-Play 2</th>
<th>Role-Play 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>69</td>
</tr>
<tr>
<td>Sum</td>
<td>57.72</td>
<td>64.07</td>
<td>83.16</td>
<td>204.95</td>
</tr>
<tr>
<td>Mean</td>
<td>2.51</td>
<td>2.79</td>
<td>3.62</td>
<td>2.97</td>
</tr>
<tr>
<td>Sumsq</td>
<td>156.71</td>
<td>184.13</td>
<td>306.22</td>
<td>647.06</td>
</tr>
<tr>
<td>SS</td>
<td>11.86</td>
<td>5.66</td>
<td>5.54</td>
<td>38.30</td>
</tr>
<tr>
<td>Variance</td>
<td>0.54</td>
<td>0.26</td>
<td>0.25</td>
<td>0.56</td>
</tr>
<tr>
<td>St. dev.</td>
<td>0.73</td>
<td>0.51</td>
<td>0.50</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Table 3

ANOVA Summary for Weighted Means from Group 2

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>15.25</td>
<td>2</td>
<td>7.63</td>
<td>22.72</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Error</td>
<td>14.77</td>
<td>44</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects</td>
<td>8.29</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38.30</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

did not fully answer Question 2. Although the findings indicated a significant change in the quality of written reflective thought for Group 2 and no change for the control group, a direct comparison could not be calculated. The researchers hypothesized that even though Group 2 showed a significant change and Group 1 did not, there still may not be a difference in the overall reflective scores for each group if they were compared.

As an additional descriptive measure for Group 1 and Group 2, the researchers evaluated the type of reflective comments that were made for Role-Play 1, Role-Play 2, and Role-Play 3. For each role-play, the number of reflective comments from the whole group was divided into percentages across the reflective scale from 0-7 (see Figure 1). This simple analysis showed that students in Group 1 consistently engaged in basic dialogic reflection throughout the process. There was very little change or increase in the type of reflective thought that was used throughout each quarter where video was not utilized. Very little reflective thought occurred anywhere; almost all of the students’ thought was dialogic (Level 4) reflection.

The same basic analysis was done for Group 2 and the researchers did a side-by-side comparison of each role-play (see Figure 2). In Role-Play 1, for Group 1, the control group, over half (61%) of all their responses made were dialogic reflection as compared to (31%) for Group 2. Group 1 had only 1% of responses coded at a higher level of reflection, 5, 6, or 7, compared to 7% for Group 2. This trend continued in Role-Play 2. Group 1 had 74% of all reflections coded at a Level 4 and only 5%
Figure 1
Percentage of Reflective Scores for Group 1 Across Three Role-Plays

Figure 2
Percentage of Reflective Scores for Group 2 Across Three Role-Plays
at higher levels, compared to Group 2, where only 23% were coded at Level 4 and 11% at higher levels. In the final role-play, Group 1 had 78% in Level 4 and only 4% in higher levels, compared to Group 2, who had 45% at Level 4 and 15% at higher levels. Overall, Group 1 students tended to describe what they saw, with little higher level reflection, whereas Group 2 students were more likely to briefly describe what they saw and then engage in critical reflective thought.

Discussion

If it is an accurate assumption that critical reflection leads to changes in teaching practice, these findings would lead one to believe that Group 2 students may be more likely to change their behavior in the future. In the same context, Group 1 students, on the other hand, engaged in little critical thinking, which might lead one to believe that they would be less likely to reflect on problems that occur in the classroom, and subsequently, be less likely to change their behavior.

The importance of reflective practice for family-teacher collaboration is not disputed within the literature. Many teacher preparation programs include some aspect of reflective practice. Effective teachers are considered reflective (Schön, 1983) and collaborative (Turnbull et al., 2006). Effective special education teachers develop strong collaborative bonds between families and support professionals.

Expert teachers reflect on their actions and use reflection to solve problems. Role-plays are often used as a means of developing collaboration skills. This study examined the development of reflective thought among special education teacher candidates as they created collaborative bonds during role-plays. The use of video appears to have a positive impact on the quality of student reflections. Students in Group 2, the treatment group, made significant gains when they reviewed their role-plays that had been placed on the streaming server. By contrast, students who did not review their role-plays through the streaming server, those in Group 1, continued to engage in a lower level of dialogic reflection.

Specific instructional recommendations for increasing the quality of reflective thought are inconsistent within the literature. Findings from the present study suggest that incorporating the use of video as part of an instructional methodology of reflective practice provides opportunities for positive teacher preparation outcomes.

Two variables of reflective practice require further investigation: time between actions and reflections, and prompts for reflections. One method commonly used to develop reflective thought is journaling after simulations or practice teaching and/or after observations. Preservice teachers are frequently asked to respond to explicit prompts given by an instructor or are asked to journal or reflect on student experiences. Adding the implementation of a mid-point step, such as requiring students to view themselves, may add a significant and important component to developing higher quality reflections.

When a preservice teacher watches his or her performance (on video) and reflects on his or her behaviors, we believe that his or her reflections are grounded in actual events rather than a memory of those events. For example, at the end of the quarter, students in Group 2 sent the instructor several unsolicited comments via email that help describe this phenomenon. As one student stated:

If the role-plays weren't videotaped, I would be forced to write a reflection on an event that I wasn't really equipped to write. When I am in the midst of the role-play, I'm not thinking about my future reflection, but what I should be saying at the time. The videos allowed me to focus directly on one aspect for improvement or to look at the whole picture of our role-play. Though it is nerve-racking at the time of the videotaping, the benefits reaped are far worth it.

—Reflective Comments of M.W., 03/04

Other spontaneous discussion about the role-plays and video occurred and students sent the instructor follow-up, unsolicited emails. Students responded positively to the use of streaming video on multiple levels. For example, preservice teachers consistently commented on how helpful reviewing their performance was:

I just wanted to let you know how great it was to have the role-plays on video. Having the videos on Blackboard made reflecting a much more in-depth process. I was able to go back, listen, and watch exactly what happened in the role-play, not just what I thought happened.

—Reflective Comments of K.R., 03/04
You can really look at what you were doing in order to reflect accurately.

—Reflective Comments of J.H., 03/04

Students also stated that they reviewed individual role-plays on numerous occasions:

The video could be played over and over to 'see' different things that could be worked on ... Being able to observe yourself multiple times, identifying personal mistakes strengthened by resolve not to repeat the identified mistakes.

—Reflective Comments of T.T., 03/04

I was able to rewind the tape and scrutinize my performance detail by detail. Using a videotape as a means for reflection gives a much clearer picture of how I actually performed. I really appreciated this asset and feel I could not have given as accurate a reflection on my role-play without it.

—Reflective Comments of K.H., 03/04

Student accountability for performance is also far greater when video is used. In our study, students were accountable for their actions because their actions were preserved on tape. In one instance during the study, two preservice teachers made inappropriate comments. Before viewing the tapes, there was much discussion and denial by the preservice teachers that their behaviors had occurred. After viewing the tape, both the preservice teachers involved and the other classmates agreed that the choices and statements made were not acceptable. Preservice teachers could not deny the fact that they had made an offensive statement and were forced to reinterpret what had transpired.

Limitations

The generalizability of these findings is limited due to the small number of participants and the nature of the investigation. Participants were all special education preservice teachers who were enrolled in a course within their major; topics of the role-plays were specific to special education content; and the nature of the course content supported reflective and collaboration processes. It is unknown how these preservice teachers would have responded if the role-plays had taken place in another course, such as an assessment or evaluation course, in which reflection was not the focus. Data from special education preservice teachers who enrolled in their student teaching internship might have exhibited a higher developmental level of reflective thought due to the nature of the internships. In other words, student teaching interns who are participating in actual parent-teaching conferences may have generated Level 7 reflections due to the critical nature of the experience not their development of reflective thought.

Participants' writing skills, both mechanics and expression, varied greatly and may have impacted the accuracy of the data analyses. For example, one participant's reflections did not include complete sentences; her reflections were written as an outline. Another participant's reflections contained several long, run-on sentences, resulting in unclear meanings. Analyses of reflections written by only skilled writers could have produced higher levels of reflective thought.

Finally, the technology posed several limitations. The turnaround time for posting the videos on the college server was often inconsistent. The time between taping and posting ranged from two to five days. Finally, the quality of the recording was inconsistent and dependent on the viewers' media software. At times the quality of the reflection might have been impeded due to poor video quality.

Implications for Research and Teacher Preparation

The implications of this study for teacher preparation are, at least, threefold. First, streaming video used in conjunction with role-plays can serve as an effective instructional tool when developing reflective thought. Second, preservice instructors must receive technology assistance to support their endeavors in utilizing streaming video resources. Finally, teacher preparation institutions must provide reasonable access to streaming video servers and other resources in order to scale up such projects.

Streaming Video and Role-Play Review

The results of this study indicate a relationship between recording performance in a role-play, reviewing it at a later date, and an increase in reflective thought. We do not believe that the medium of digital delivery is necessarily a determining factor in the increase in student
performance (as it could be argued that using a VHS tape may produce the same effect). However, students did have specific thoughts and opinions relative to the particular medium of delivery, streaming video, and expressed them accordingly. Regardless of the video medium, preservice teachers seemed to value the opportunity to observe their performance for reflective purposes.

**Implications for Instructors**

Although participants valued the use of video and data analysis showed an increase in reflective thought, several notes of caution must be mentioned relative to implementing a streaming video project, including technology support and access to video servers.

**Technology support.** Faculty and graduate students from the instructional technology program on campus agreed to assist with converting the videotapes to streaming video. This turned out to be a much larger task than anticipated. First, the instructor had no knowledge of filming techniques, which sometimes led to both poor audio and picture quality. These problems were heightened during the encoding process. Second, the instructor’s lack of basic technical knowledge periodically delayed posting of the videos on the server. These problems included the lack of time codes or confusion over the number of role-plays on a particular tape. Making such a project sustainable requires clear guidelines for creating video suitable for streaming.

Third, a structured plan is necessary for recording and delivering tapes to those responsible for readying them for streaming. Although faculty and graduate students were willing to post the role-plays, miscommunication often occurred regarding the graduate students’ roles. For example, the graduate students often decided among themselves who would render the tapes, but failed to communicate this to the instructor. This resulted in delays, as the instructor unknowingly delivered the tapes to the “wrong” student or location.

**Access to streaming video servers.** During the initial trials of the project, faculty from the instructional technology program were not provided with access codes to the streaming video server. As a result, rendered role-plays had to be posted by a university gatekeeper. Although this individual was exceedingly helpful and willing to support the project, he was not always on campus and available to upload the files as promptly as desired by the instructor. It took three academic quarters before access to the server was made readily available to key faculty.

Computers and computing technology are available on most college campuses and students generally have computers at home. Through the use of streaming video, students who participate in simulations and role-play activities can readily review and reflect on their individual performance. Unlike VHS tapes that have to be copied and used with a television and a VCR, a single digital video can be available for streaming to multiple users simultaneously. Another advantage of streaming video is the ability to quickly move around within the video to rewatch or skip isolated sections. Although the use of video is not without glitches (including students who have a modern connection and attempt to access the video from home), streaming video has promise for use in preservice education programs as a means of aiding in the development of reflective thought.

**Conclusions**

Research supporting methods for increasing special education preservice teachers’ reflective practices and collaboration skills can increase the opportunities for effective partnerships in schools. In addition, finding ways to improve communication between practitioners and families can only enhance the quality of support for P-12 students. Even though technology is available for classroom use, it is often underutilized (Cuban, Kirkpatrick, & Peck, 2001). Finding ways to effectively and judiciously use existing technology to promote student learning increases the likelihood that educators will integrate technology (Rogers, 2000; Sherry, Bilig, Tavalin, & Gibson, 2000). If the effective use of streaming video and its positive impact on learning in the context of reflective practice continues to be documented, it will provide one more valuable element for higher education faculty to include when they reorganize their courses to meet the ever-changing, and challenging, national teacher standards.
References


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