RECONSTRUCTING PRACTICE FOR CHANGE: THE EFFECTS OF ELECTRONIC

PORTFOLIO DEVELOPMENT ON PRESERVICE TEACHERS' INQUIRY AND GROWTH

by

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(Under the Direction of Michael J. Hannafin)

ABSTRACT

Since the mid 1980s portfolios have been used within teacher education programs in an attempt to holistically assess teacher practice, make field experiences more visible to university faculty and support personnel, develop reflective and content knowledge skills, and promote teacher inquiry. Despite these claims, most portfolio practices either focus on summative assessments or fail to include sufficient information to justify conclusions. Even when portfolio research reports reliable assessments, several proponents question preservice teachers' ability to focus on and examine teaching practices because of their inexperience, and cite time and resource requirements as hinders to portfolio development.

This dissertation is a compilation of four, journal-ready manuscripts that explore electronic portfolio development that employ evidential reasoning and formative assessment for preservice teacher professional development. The first article is a review of portfolio literature across the teaching profession that identifies successes and hurdles to sustained portfolio development. The second article is a preliminary case study of three preservice social studies teachers who used video-based evidence and electronic portfolio (eportfolio) tools to support evidential reasoning practices. The third and fourth articles are case studies of six preservice social studies teachers who also used eportfolios to support evidential reasoning but included multiple sources of evidence to examine teaching practices within field-experiences. These articles describe how eportfolios can support evidential reasoning when embedded question prompts, personal coaching, and embedded tutorials and inquiry suggestions are provided.

INDEX WORDS: Preservice teacher, Student teacher, Portfolio assessment, Inquiry, Evidence, Reflection, Scaffolding

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DEDICATION

This work is dedicated to Kimberly, Laila, Jefferson, and Adam. Thank you for your support, patience,

and confidence.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Current research stresses the importance of evidence, particularly measurable outcomes of student achievement, to assess teacher quality (Cochran-Smith, 2005). While many researchers contend that randomly-assigned experiments are the best source of evidence (Whitehurst, 2002; Wineburg, 2006), these practices may be impractical for individuals interested in improving their teaching practices. With the introduction of systemic reflection to examine and improve professional practice (Schön, 1983, 1987), teachers and teacher education programs have turned to journals, performance-based assessments, teaching portfolios, and other practices to document and examine teaching outcomes (Bird, 1990; Caroll, Pothoff, & Huber, 1996; Wolf, 1991). Often, these practices are aligned with professional standards (Delandshere & Petrosky, 2004; INSTASC, 2005). Recently, educational institutions have placed particular emphasis on teaching portfolios as a source of evidence about preservice teacher practices (Gatlin & Jacobs, 2002; Loughran & Corrigan, 1995).

Adopted in the 1980s as a means to demonstrate holistic teacher practice (Bird, 1990; Wolf, 1991), portfolios are commonly used in teacher education for graduation and licensure purposes (Delandshere & Arens, 2003; INTASC, 2005), accreditation of teacher education institutions (NCATE, 2002), and advanced certification (Burroughs, 2001; NBPTS, 2004). Teacher education programs have also used portfolios to enhance technology skills (Keefe, et al., 2002; Wright, Stallworth, & Ray, 2002), aid reflective practices (Borko, Michalec, Timmons, & Siddle, 1997; Land & Zembal-Saul, 2003), and demonstrate professional knowledge (Avraamidou & Zembal-Saul, 2003; Fallon & Watts, 2001). Regardless of their application, portfolios are assumed to provide valid evidence of teacher practice that is unavailable through other methods of inquiry (Barton & Collins, 1993; Bird, 1990; Wolf, 1991).

Despite the widespread adoption of portfolios in teacher education, comparatively little evidence exists regarding their support for teacher development (Borko et al., 1997). In a review of portfolio at three teacher education institutions, Delandshere and Arens (2003) found that the majority of portfolios

failed to adequately explain how artifacts aligned with identified standards or documented teacher development. Zeichner and Wray (2001) reported similar problems. After a review of portfolio literature, they concluded that most studies failed to include sufficient implementation details to make judgments regarding portfolio outcomes. Although many teacher education programs incorporate portfolios into practicum experiences, implementation methods as well as assessment functions tend to vary widely.

Yet, some portfolio projects have proven beneficial. In a study by Borko et al. (1997), preservice teachers indicated that portfolio development helped them to reflect more deeply about current practices. Land and Zembal-Saul (2003) reported similar results in an electronic portfolio study of preservice science teacher's abilities to identify properties of light through classroom activities. The collection and examination of portfolio artifacts from several hand-on experiments helped most preservice teachers to reflect upon and develop content area skills when supported through technological and coaching scaffolds.

Despite reported benefits, several limitations have also been noted with portfolio uses among preservice teachers. These limitations include the anecdotal nature of many portfolio studies (Wade & Yarbrough, 1996; Zeichner & Wray, 2001), the need for coaching to adequately support portfolio practices (Borko et al., 1997; Carroll et al., 1996), and large time and resource requirements from both preservice teachers and teacher education faculty to support them (Fallon & Watts, 2001). Lastly, most portfolio literature focuses on summative assessment purposes (Grossman, 2005; Wright, Stallworth, & Wray, 2002). Although these portfolios document current knowledge, they often fail to establish or document a trajectory of teacher growth.

Because portfolios are becoming increasingly popular within teacher education programs, it is important to establish methods that help preservice teachers collect and interpret artifacts for program purposes, encourage formative assessment, and demonstrate professional growth over time. Evidential Reasoning and Decision Making (ERDM) methods may facilitate portfolio production to examine and improve active student engagement in classroom settings. ERDM methods are designed to help individuals identify, generate, and interpret evidence of practice in their profession (Recesso, et al., in

press). In this case, preservice teachers could use ERDM methods to focus on a specific aspect of their teaching, collect related evidence during field experiences (e.g., lesson plans, video recordings, and literature reviews, and student work samples), and analyze it based on professional standards and frameworks to identify areas of mastery and in need of improvement.

Purpose

This dissertation is a compilation of manuscripts that collectively examine the use of electronic portfolios to sustain professional development among preservice teachers using principles of evidential reasoning. The studies reported within this document were part of an ongoing research program to examine the use of evidence to improve teacher practices and assessment. The four manuscripts contained in this dissertation are written in journal-ready format and provide insights into the use of electronic portfolios to promote formative assessment among preservice teachers and support evidential reasoning principles.

The first article is a literature review regarding the role of portfolios throughout the teaching career. It highlights both summative and formative assessment purposes of portfolios, identifies claimed benefits, and addresses current limitations in portfolio research—including the need of portfolio research that captures longitudinal analyses, and identifies support mechanisms to sustain portfolio development at key transition points within the profession.

The second article is a preliminary case study of three preservice social studies teachers who used electronic portfolio (eportfolio) tools and video-based evidence to examine active student engagement during a 12-week field experience. Results indicated that video-based evidence facilitated reflection, supported inquiry into classroom success, and influenced self-improvement plans by re-creating classroom events from differing perspectives than preservice teachers had previously experienced. Eportfolio tools and supports also helped participants to systematically examine their evidence and draw conclusions. Despite these benefits, participants expressed doubt in using these tools beyond graduation because they failed to observe practicing teachers enacting similar practices during field experiences.

The third article follows six preservice social studies teachers who used eportfolio tools to examine active student engagement during a 12-week field experience. Unlike the preliminary study, however, participants not only examined video-based evidence, but also selected a minimum of two additional sources to compensate for limitations introduced in video recordings and triangulate findings. Results indicated that evidential reasoning methods helped preservice teachers to broaden their definitions and observations of active student engagement, re-examine and modify teaching conclusions based on classroom evidence, and formulate improvement plans for future implementations.

The fourth article is an analysis of support mechanisms that facilitated eportfolio development using evidential reasoning methods. Examining eportfolio practices of six preservice social studies teachers, we found that embedded directions, tutorials, and question prompts helped participants to identify inquiry foci, collect and examine evidence, and draw conclusions from their analyses. However, substantial coaching and personal support were required to use technological tools and provide adequate explanations of eportfolio evidence.

Our intent is that research on the systematic use of eportfolios based on evidential reasoning principles will not only inform best practices at our institution by designating support requirements among personal coaches and embedded scaffolds, refining evidence boundaries, and exposing weaknesses in current implementation, but will also inform other teacher education programs regarding these practices. The remainder of this document examines current portfolio literature and indicates how our studies extend this knowledge base.

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CHAPTER 2

LITERATURE REVIEW: RE-EXAMINING CLAIMS AND EVIDENCE OF PORTFOLIO USE

DURING TEACHER DEVELOPMENT[1]

Background

Portfolios are used for a myriad of purposes throughout the teaching career. Since the mid 1980s, teachers have organized lesson plans, student work samples, reflections, and other artifacts within professional portfolios to document teaching ability, promote alternative assessment, obtain promotion or advanced certification, and guide inquiry (Bird, 1990; Carroll, Pothoff, & Huber, 1996; Wolf, 1991). Portfolios can facilitate communication between beginning teachers and mentors to promote professional development (Brennon, Thames, & Roberts, 1999; Sullivan & Glanz, 2000; Zepeda, 2002). Veteran teachers construct portfolios to document best practices, collaborate with peers, and pursue advanced certifications (NBPTS, 2007a).

However, the nature of portfolios has shifted during the past decade. Recently, authorities have advocated a range of structures and evidence (Tillema & Smith, 2007; Zepeda, 2002). Several authorities have advocated fundamental shifts in the functions and uses of portfolios, emphasizing formative assessment uses to improve teacher development over summative approaches designed to document them (Anderson & Frieson, 2004; Koper & Tattersoll, 2004). However, the impact of formative applications has not been well established. While researchers have examined perceptions of formative portfolio practices among preservice teachers and faculty, most studies provide anecdotal reports or describe program implementation. Literature on formative assessment portfolio use among beginning and induction teachers is particularly sparse. While portfolios are believed to facilitate self-assessment, promote professional development, and foster collaboration, little has been documented regarding impact across teaching careers. In this paper, we examine briefly how portfolios have been implemented throughout teacher development, assess the strengths and limitations of formative approaches, and identify unresolved issues for formative portfolio research, theory and practice.

Portfolio Use in Teacher Development

Product or employment portfolios are typically used summatively (Grossman, 2005) to demonstrate specific skills, mastery of course objectives, or compliance with professional standards (Barton & Collins, 1993). However, studies examining the impact of summative assessment portfolios are

rare and tend to emphasize perceptions over performance (e.g., Naizer, 1997; Tillema & Smith, 2007). As part of an "exit portfolio" (p. 11), for example, preservice teachers in one study included resumes, classroom management plans, assessment instruments, self-evaluation, and other documents over a ten-week field experience (Reis & Villaume, 2002). Faculty used a rubric at the end of the semester to assess whether required components were included. Responding to exit surveys and interviews, preservice teachers indicated that portfolios helped them to reflect upon their teaching philosophies, plan and organize resources, and prepare for employment interviews. Faculty members stated that portfolios helped students focus on learning objectives and prepare for employment.

Experienced teachers also construct summative assessment portfolios in partial fulfillment of the National Board for Professional Teaching Standards (NBPTS) advanced certification. Believed to represent holistic assessments of practices, teachers collect work samples and video artifacts representing their classroom practices, accomplishments, and students' learning (NBPTS, 2007a). Thus, teachers develop summative assessment portfolios at various career stages to document defined requirements, meet established objectives, and address standards. Summative portfolios uses, in effect, have directly influenced the continuum of decisions related to compliance with preservice preparation requirements and certification.

Summative assessment portfolios have also been used to formalize teaching philosophies and decisions, demonstrate current skills or mastery of professional standards, and prepare for employment or promotion. However, several concerns have been documented including extensive time and resource requirements for implementation, wide variations in perceptions of portfolio purposes, and short-term implementations. Preservice teachers reported benefits to summative portfolio production, but reported that time required was the major deterrent to implementation (Reis & Villaume, 2002). Many reported feeling overwhelmed trying to teach while collecting and reflecting on portfolio artifacts. Similarly, teacher preparation faculty members reported time constraints when discussing portfolio content with preservice teachers, providing feedback, and facilitating revisions during the 10-week implementation.

Additionally, preservice teachers and faculty may hold different perspectives regarding portfolio purposes. Preservice teachers at three teacher education programs indicated that they designed portfolios to facilitate employment and demonstrate teaching skills rather than to monitor and improve their teaching skills (Delandshere & Arens, 2003). Consequently, they highlighted their best practices. Similarly, faculty members used portfolios for program accreditation and to demonstrate quality instructional practices rather than to support or document improvements in preservice teacher practices. Thus, conflicting purposes were evident regarding purpose, ownership, and use beyond graduation.

The extensive effort required to develop summative portfolios has led some to question their value (e.g., Burroughs, 2001; Delandshere & Petrosky, 2004). Several competing priorities are apparent, including the physical, mental, and emotional demands of teaching (Feiman-Nemser, 2001), high attrition among beginners (Villani, 2002), limited time for planning and professional learning (Clow, McAndrew, & Taylor, 2004) and the increased emphasis on student achievement (Cochran-Smith, 2005; Cochran-Smith & Fries, 2005).

In contrast, formative assessment portfolios (i.e., process or working portfolios) are designed to systematically examine and refine teaching practices. Using a range of artifacts, teachers establish baseline performance, develop and pursue teaching improvement goals, and examine in situ classroom phenomena to inform their practice. As summarized in Table 2.1, both traditional and electronic formative portfolios have been used and studied to hone pedagogy and content skills, facilitate critical thinking, reflection, and self-assessment, and promote inquiry and collaboration (Borko, Michalec, Timmons, & Siddle, 1997; Viechnicki, Barbour, Shaklee, Rohrer, & Ambrose, 1993). While increasingly popular, however, formative assessment portfolio literature rarely addresses their influence on teacher development throughout their careers. In the remainder of this paper, we examine formative assessment portfolio implementation throughout teacher development, evaluate associated claims, issues and limitations, and identify unresolved issues for advancing needed research, theory, and practice.

Formative Portfolios in Preservice Teacher Education

While most formative assessment portfolios focus on preservice teachers, considerable variability exists regarding how they are used in teacher education. Formative portfolios have been used to facilitate reflection (Wade & Yarbrough, 1996), develop content knowledge, introduce project-based learning and teacher accountability (Barton & Collins, 1993), encourage standards-based practices (Fallon & Watts, 2001), explore teaching assumptions, foster communication, and organize lesson and unit materials (Loughran & Corrigan, 1995). Different applications, however, can be classified according to their goals or function.

Encouraging Holistic Assessment

Formative portfolios have been used to promote standards-based practices, identify teaching competencies, and introduce teacher accountability. Barton and Collins (1993), for example, described how portfolios helped teacher education faculty obtain a richer sample of prospective teachers' practices than was possible with traditional testing. By collecting ongoing evidence of teaching practices over two semesters, preservice teachers were better able to justify or refute claims about their teaching beliefs and practices. Several researchers have identified portfolios as a tool for authentic assessment. Herman and Winters (1994) suggested that portfolios better account for local policies and practices when assessing individuals. They also asserted that formative portfolios measure actual performance rather than knowledge or aptitude, which multiple-choice exams are unable to accommodate effectively.

Formative portfolios have gained momentum in the teaching profession because of dissatisfaction with traditional assessments and the belief that portfolios provide rich teaching evidence (Bird, 1990; Wolf, 1991). According to Wolf, Whinery, and Hagerty (1995):

teaching is like dry ice at room temperature—it evaporates in front of our eyes and leaves no visible traces. In most cases there is little tangible evidence of the teaching that took place, and consequently, only a limited opportunity to examine its strengths and weaknesses…Teaching portfolios address this problem by providing teachers with a structure for documenting and reflecting on their practice (pp. 30-31).

Barton and Collins (1993) also described how portfolios increased accountability. In their study, both literacy and science preservice teachers selected an aspect of teaching to refine, developed learning goals, and identified evidence they believed would demonstrate their understanding. Over two successive semesters, they studied their selected aspect, gathered and developed identified evidence, and judged the worth of their evidence in relation to peer and faculty feedback. According to Barton and Collins, portfolios helped preservice teachers take responsibility for their learning, systematically pursue specific teaching interests, and identify teaching artifacts to stimulate communication with faculty members and provide context for assessment.

Improving Classroom Discourse

Teacher educators often have few opportunities to observe preservice teachers' field experiences. Thus, they often rely on feedback from cooperating teachers and support personnel, student and peer evaluations, reflective journals, classroom discussions, and portfolios to gain insights into classroom practices and inform assessments. Portfolios, in such cases, may help preservice teachers to clarify and document classroom practices to mentors and teacher educators. In a study examining preservice teacher perceptions towards portfolios, Loughran and Corrigan (1995) suggested that portfolios act as a "window into the teaching and learning achievements of the teacher" (p. 566), providing artifacts of instruction, reflections into teacher thought-processes, and samples of student achievements. Through organized materials in formative portfolios, preservice teachers can reconstruct classroom practices as well as identify teaching decisions and student reactions for support personnel. Conderman (2003) reported that portfolios can provide common ground for discussion about teaching practices. Mentors and other support personnel can align discussion topics and suggestions for future practice with portfolio artifacts and tangible evidence.

Facilitating Self-Assessment

Formative portfolios can also document changes in teacher reasoning and self-assessments as preservice teachers examine their own practice. To support these endeavors, many teacher education programs emphasize reflective practices, inquiries, and action research. Indeed, Bullock and Hawk (2001,

12

p. 13) note that "without written reflection, a portfolio is just a scrapbook." Formative assessment portfolios are believed to facilitate these practices through the systematic collection, organization, and retrieval of teaching artifacts.

Teacher reflection is perhaps the most frequent type of self-assessment supported by formative portfolios. According to Schön (1987), reflection-in-action involves near instantaneous decisions made "in the moment." Because decisions are made rapidly, reflection-in-action often distinguishes experienced professionals from beginners. By contrast, reflection-on-action describes intense scrutiny of classroom practices and decisions following teaching. Formative assessment portfolios are believed to clarify the former and facilitate the later. Using student essays, end-of-semester questionnaires, and interviews collected over two semesters of portfolio development Wade and Yarbrough (1996) examined the extent to which portfolios assist preservice teachers' reflections. They found that portfolios helped preservice teachers to reflect on their practices when clear purposes were articulated, programmatic structures guided artifact collection and analysis, faculty provided frequent feedback, and preservice teachers assumed ownership through personal expression and organization of materials.

Borko et al. (1997) also examined the extent to which portfolios influenced preservice teachers' personal reflections during field experiences. Preservice teachers collected program mandated and self-selected artifacts, organized them within a portfolio, and answered a series of reflective questions related to their rationale for artifact inclusion, teaching practices represented, and subsequent learning from the teaching experience. Reflective statements were not graded; rather, faculty provided written feedback regarding the appropriateness of artifacts, the degree to which preservice teachers answered reflective prompts, and overall thoughts regarding individual portfolios. Interviews of participating preservice teachers and faculty indicated that portfolio development was perceived as helping preservice teachers to connect theory with classroom practices and to reflect on their own teaching experiences.

Promoting Skills Acquisition

Portfolios have also been used to develop content and pedagogical skills among preservice teachers. In a quasi-experimental study, Green and Smyser (1995) examined the degree to which teaching

portfolios affected preservice teacher's conceptions of good teaching with respect to the teacher's role, students, classroom management, professional growth, teacher evaluation, and reflective practices. The experimental group produced portfolios over the course of the semester while the control group did not. The experimental group also received mentor and peer feedback on their portfolios throughout the semester. A pre and post questionnaire consisting of 54 semantic differential items (nine for each of six categories) was administered to identify group differences. These researchers found that preservice teachers' perceptions changed dramatically when they developed portfolios. Although they placed more value on teacher evaluation than the control group, they also recognized the difficulty in achieving it. The experimental group also placed more value in professional development, and stated that reflection was an active, complex process that benefited all teachers. Finally, their conceptual understanding associated with teaching emphasized joint collaboration and continued growth beyond teacher education.

Reflection played an important role in several portfolio studies. Grant and Huebner (1998) examined the extent to which portfolios facilitated inquiry into teaching practices. Over a year-long period, preservice teachers developed a question regarding their classroom practices and used portfolios to organize inquiries as well as to examine and reflect on evidence. When they interviewed six of the 54 individuals to assess their use of portfolio practices three years later, three teachers indicated continued use of the inquiry principles, data collection, and analysis techniques introduced through their preservice portfolios. Loughran and Corrigan (1995) concluded that portfolio development—collecting, organizing, and reflecting upon teaching artifacts over a semester-long field experience—helped preservice teachers to better examine their own perceptions, clarify teaching philosophies, and present their thoughts. One participant compared portfolio development to written argumentation: When artifacts were placed in a specific order, the argument can be formulated and supported. Thus, portfolio development may help preservice teachers to formalize teaching philosophies, provide supporting evidence related to their teaching practices, and identify strengths and weaknesses for future examination.

Issues and Limitations

Despite widespread use and reported benefits, several issues remain with formative portfolio uses in teacher education. Little systematic research exists regarding the effects of portfolios on preservice teaching and professional development. Although advocates suggest that portfolios foster authentic and self-assessments and facilitate professional development and skill acquisition, claims are often based on impressions and anecdotal accounts rather than performance evidence (Borko et al., 1997; Delandshere & Arens, 2003; Wade & Yarbrough, 1996; Zeichner & Wray, 2001). Additionally, portfolio literature stresses the time and resource needs of portfolio development, including the need of long-term coaches or mentors to aide both faculty and students in portfolio development and assessment (Borko et al., 1997; Fallon & Watts, 2001). Yet even when these resources are available, research tends to focus on short-term applications conducted mainly during field experiences—a limited and constrained scope for professional development.

Anecdotal. Although hundreds of articles describe presumed benefits associated with portfolio use among preservice teachers, few actually test these presumptions. Rather, they provide anecdotal accounts, document implementation procedures, and emphasize faculty or preservice teacher perceptions. Haertel (1991) suggested that teacher educators have adopted portfolios without verifying their assessment and professional development capabilities. When researchers report portfolio benefits, Zeichner and Wray (2001) noted they often fail to provide sufficient information to permit careful scrutiny. They suggest that portfolio reports need to indicate the primary purpose of portfolio development, underlying structures supporting their construction, the degree to which artifacts are mandated, levels of support provided, and how portfolios are assessed to better inform other practitioners. Similar concerns have been expressed when examining artifacts and reflections within portfolios (Delandshere & Arens, 2003; Delandshere & Petrosky, 2004; Zeichner & Wray, 2001). Although researchers report benefits for reflective practices, studies fail to clarify how reflective practices are defined, portfolios facilitate reflective processes, or reflection differs among those who or do not maintain portfolios.

Reliability and validity. Some researchers have reported well-documented uses of portfolios among preservice teachers. Naizer (1997), for example, examined inter-rater reliability among assessors, comparison between portfolio success and course grades, number of education courses taken, prior teaching experience, and scores on specific knowledge assessments. He found that portfolios could be reliably graded when purposes and criteria were explicitly stated and formal training occurred. He also found that portfolio success was a good indicator of course grades, strategic and pedagogical knowledge, and prior experience teaching. While this study focused on portfolio development in a single course during one semester, it demonstrates a level of empirical rigor rarely found in portfolio literature.

Other researchers have raised important questions as to the reliability and validity of typical portfolio contents, structures, or assessments (Haertel, 1991; Tillema & Smith, 2007; Zeichner & Wray, 2001). In their study of portfolio uses at three teacher education programs, Delandshere and Arens (2003) reported that preservice teachers were unable to relate their portfolio artifacts to identified standards. Although portfolios were designed to document evidence of student accomplishment, they failed to clarify teaching context adequately or pinpoint standards-based work for external reviewers. As a result, teacher education faculty relied on personal recollections to "fill in the blanks…and confirm that the students are 'meeting the standards'" (p. 69), thereby decreasing their reliability and raising key validity questions. Using questionnaires, interviews, and portfolio assessments among faculty members, Tillema and Smith (2007) reported varied faculty expectations regarding portfolio purposes independent of common, defined program objectives. These ideas were manifest in wide variations in the focus of and criteria for portfolio assessments even when specific grading criteria were provided to experienced portfolio assessors examining a common portfolio.

Time and resource requirements. Several researchers have noted the excessive time and resources needed to implement formative assessment portfolios effectively. Fallon and Watts (2001), for example, reported that preservice special education teachers spent between 6.5 and 10.5 hours per week developing their portfolios. Borko et al. (1997) found similar results when using portfolios to foster reflective practices among preservice teachers. During interviews, preservice teachers frequently mentioned time as

a deterrent to portfolio development. Because preservice teachers often construct portfolios during their student teaching experiences, they reported feeling overwhelmed in managing teaching responsibilities with other university requirements.

Faculty members also expend considerable time and resources during portfolio development. In a survey of 24 teacher education programs followed by selective interviews, Anderson and DeMeulle (1998) found that time constraints were frequently mentioned by faculty as limiting portfolio development. Faculty needed to expend time to assess portfolios, collaborate with students about specific contents, provide feedback and support, and become familiar with the portfolio's purposes, structures, and assessment procedures.

Researchers have also identified the need for coaches or mentors to support faculty and preservice teacher experiences (e.g., Carroll et al., 1996; Fallon & Watts, 2001). Carroll et al., (1996), for example, found that when mentors supported portfolio development, preservice teachers reported greater confidence in their portfolio abilities. Yet, teacher educators indicated that the same preservice teachers still needed portfolio training. They also indicated training needs among faculty members to facilitate portfolio development and support.

Limited useful-life. Most formative assessment portfolios span only one or two semesters— usually during field experiences (Green & Smyser, 1995; Loughran & Corrigan, 1995; Moss, Schutz, & Collins, 1998). Even when researchers study portfolio uses that span multiple semesters they rarely examine the extent to which beginning teachers continue these practices beyond graduation. Indeed, some researchers report that portfolio practices cease following graduation. Rolheiser and Schwartz (2001) conducted interviews near the beginning and end of teachers' first years to determine the extent in which 11 beginning teachers continued their preservice portfolio practices beyond graduation. Although all participants updated their portfolios in some form, only three included full written reflections—a procedure stressed during teacher education. Seven reflected through brief comments written on sticky notes and attached to portfolio artifacts. They reported that few teachers discussed their portfolios with principals and none used them for professional development. Ironically, participants in this study were

17

selected because they "were extremely positive about the portfolio process" (p. 287). Although Grant and Huebner (1998) found that the few teachers who collected student work samples and continued using questioning strategies fostered during portfolio construction characterized inquiry as a mental activity and did not organize student work to promote their own professional development.

School policies and procedures may also discourage beginning teachers from continuing portfolio practices. In response to interview questions regarding future portfolio uses, three preservice teachers stated that they never observed practicing teachers developing portfolios. They noted that cooperating teachers, principals, and other school personnel stated that portfolios were never used beyond graduation (Shepherd & Hannafin, 2007). These experiences led participants to question portfolio practices and indicate that they would not use them. Meyer and Tusin (1999) also reported lack of portfolio use among practicing teachers. Although 20 participants developed portfolios throughout their methods courses and into student teaching, only half reported seeing portfolios in the schools and none of these reports involved teacher portfolios—focusing instead on student uses.

In summary, few researchers have examined the benefits of portfolios in teacher development or the reliability and validity of portfolio assessments. Significant time, coaching, and mentoring resources are often needed to implement formative assessment portfolios. Consequently, portfolio goals and objectives have been compromised. In some applications, faculty ignored portfolio structures in favor of their recollections to assess portfolios (Delandshere & Arens, 2003). In other cases, time and resources normally dedicated to pedagogical development were used to facilitate portfolio understanding, discussion and support groups (Fallon & Watts, 2001; Green & Smyser, 1995). In still other instances, shared portfolio criteria were supplanted by individual faculty beliefs (Tillema & Smith, 2007).

Formative Portfolios in Inservice Education

The transition to teaching has proven difficult for many teachers who assume responsibility for multiple aspects of a complex classroom but lack experience to do so (Carver & Katz, 2004; Norman & Feiman-Nemser, 2005). Many do not survive the transition, with roughly one-half leaving the profession within five years (Kelley, 2004; Watkins, 2005). According to Ingersoll (2001), teacher attrition is

mediated by several transition problems and issues: job dissatisfaction, inadequate support, student discipline problems, and limited input on decision-making. These concerns, however, are not unique to beginning teachers; similar concerns are evident throughout the teacher profession and career development (Palmer, 2007; Plash & Piotrowski, 2006; Smith & Smith, 2006).

Facilitating Communication and Collaboration

Similar to preservice applications, some have suggested that portfolios can improve the accuracy of teacher assessment, provide deeper context into teaching decisions, and capture student achievements (Brennan, Thames, & Roberts, 1999; Moss et al., 1998; Orland-Barak, 2005). As they transition to the practicing professional education community, for example, beginning teachers report feeling isolated (Kilgore, Griffin, & Ottis-Wilborn, 2003; Thomas, Wineburg, & Grossman, 1998). While administrators, curriculum specialists, and mentors periodically observe teaching practices, these observations are generally few in number and of limited duration (Vavrus & Collins, 1991). Accurate assessments of teacher practice are further complicated when supervisors lack background in observed subject areas or differ in grade-levels taught (Carver & Katz, 2004).

Formative portfolios have enabled some beginning teachers to capture and share teaching episodes to foster communication and facilitate feedback. Brennan et al. (1999) described a mentoring approach where beginning teachers developed, enacted, and analyzed results based on plans to improve their practice over four portfolio development cycles within their first year teaching. Beginning teachers video-recorded their practices for review, attended workshops, and met with mentors and peer committees to discuss findings and obtain advice. Results indicated that portfolio development improved communication and feedback between beginning teachers and support personnel. According to Brennan, et al., portfolios helped to disclose classroom practices and provide common grounds for discussion. Portfolios also helped beginning teachers to both examine their practices and gauge progress towards their professional development goals.

Moss et al. (1998) described how portfolios helped teachers to evaluate their claims with supporting artifacts. As part of a validation study for Interstate New Teacher Assessment and Support

19

Consortium (INTASC), 28 beginning teachers collected lesson plans, instructional materials, implementation videos, student work samples, and reflections within a portfolio. Each portfolio was examined by eight reviewers working in pairs. Researchers documented how portfolio artifacts helped raters to examine and evaluate teacher claims: When teachers alluded to actions in reflective statements, reviewers could identify associated actions in video lessons or student work samples. Similarly, while reviewing tangible evidence researchers noted that lesson plans and reflective statements referenced learning contexts and teacher decisions. According to Wolf et al. (1995), portfolios influence teaching practice positively when augmented by conversations with the portfolio creator, focused on portfolio artifacts, and extend teaching experiences.

Portfolios can also promote collaborations among experienced teachers. Galluzzo (2005, p. 144) reported that teachers seeking National Board Certification often worked in "support groups" both to identify representative samples of their teaching and to improve their reflective skills through "peer analysis and critique." Using portfolio artifacts, experienced teachers can model best practices to novice teachers, an approach advocated during professional development (Feiman-Nemser, 2001). Several researchers have demonstrated that video cases, when supported with learning materials, can facilitate professional development (Anderson & Lignugaris, 2006; Clarke & Hollingsworth, 2000; Sherin & Van Es, 2005). Frederickson, Sipusic, Sharin, and Wolfe (1998) reported that self-assessments improved when experienced mathematics teachers collaborated to create and analyze portfolios containing video recordings of their classroom practices. However, the process of acquiring or documenting expert cases can prove costly (Stephens, Leavell, Fabris, Buford, & Hill 1999), captured practices may be mismatched with local curricula or school policies (Simmons et al., 1999), or fail to account for locally acceptable teaching-learning procedures (Yaday & Koehler, 2007).

Promoting Self-Assessment

In order to make reasoning increasingly visible, some induction programs incorporate reflective journaling within portfolios to document teachers' decisions and rationales for classroom practices. Similar to preservice teachers, beginning teachers have reflected as they examine and assess their

professional development (Orland-Barak, 2005). Thompson (2002) characterized portfolio-based teacher reflection as integral to North Carolina's three-year induction program. Similarly, when describing the uses of reflection among beginning teachers in Israel, Orland-Barak (2007) described how inservice mentoring is structured around reflection within portfolios, wherein reflections act "as catalysts of professional growth and change and as the primary texts in staff development and mentoring programs" (p. 28).

Additionally, the use of formative portfolios enabled beginning teachers to examine practices often unavailable to preservice teachers. Rolheiser and Schwartz (2001) reported that when teachers incorporated portfolios to assess student performance over time, the portfolios helped to clarify their beliefs and teaching philosophies, develop structured arguments, and promote portfolio use and reflection with their students. One first-year teacher used his portfolio to prepare for parent conferences by examining student evidence. Sustained portfolio production throughout the school year may encourage teachers to focus on individual student practices, assess growth over time, and inform decisions with evidence.

Fostering Skill Acquisition

Formative portfolios may also improve instructional practices and promote inquiry and reflection among students. During a ten-year implementation where 124 teachers were followed during their first year of teaching in Colorado, Kelley (2004) noted that portfolios coupled with mentoring helped participants inspect their own classroom practices through close examination of lesson plans, implementation videos, and peer feedback. At the conclusion of portfolio practices, teachers and principals reported that beginning teachers became more knowledgeable about teaching practices during their experience.

Miller, Morley, and Westwater (2002) described the influence of a state mandated portfolio on beginning teachers' classroom practices and self-assessments of core standards. As part of the Beginning Educator Support and Training (BEST) Program implemented in Connecticut, second-year physical education teachers developed a portfolio, including detailed lesson logs, videotapes of teaching, and

21

student work samples that corresponded to national standards initially introduced during teacher education courses and field experiences. Portfolios were rated by experienced teachers at the end of the school year. Based on anecdotal reports, the researchers indicated that portfolio practices helped beginning teachers to implement developmentally appropriate models of physical education (based on social responsibility, fitness, and other characteristics) rather than solely sports-based performance models typical prior to the BEST program.

Portfolios have also been used to foster professional development among experienced teachers. By examining written reflections about portfolio use in English education from 250 pre and inservice teachers, Sunstein and Potts (1998) reported that portfolios were used to identify gaps in teacher understanding, examine teaching practices they did not initially anticipate, and develop goals for further study and evaluation. Viechnicki et al. (1993) found that teachers who gathered and reflected weekly on anecdotal student records were able to isolate student difficulties and better tailor instruction to meet individual needs.

While the development of a video-based portfolio to document teaching accomplishments and recent classroom practices is decidedly summative in nature, in-service teachers have reportedly collaborated during portfolio construction. "Take One!", for example, enables interested teachers to conduct an intensive study of NBPTS standards, complete a video-based portfolio entry, and submit it for evaluation from NBPTS certified portfolio reviewers (NBPTS, 2007b). Although teachers cannot use this entry for partial fulfillment of the National Board Certification requirement, the experience is believed to help teachers prepare for the actual portfolio process because they receive detailed feedback on their entry from portfolio reviewers.

Similarly, some studies suggest that mentoring the portfolio process influences teachers' professional development. Through focus-group interviews and electronic questionnaires, Robinson (2005) found that twenty portfolio assessors reported gaining awareness of their best practices, confidence in their teaching methods, increased reflection on their experiences, and recognition of ways to mentor novice music teachers through the assessment of second year BEST portfolios. Anecdotal findings

reported by Pardini (2002) indicated that portfolio reviewers (comprising experienced teachers and local teacher education faculty) analyzed their own practices and methods because they enacted similar reviews among beginning teachers. They also strengthened relationships between school administrators, teachers, and teacher educators. Brennan et al., (1999) Miller et al., (2002) provided similar anecdotal support from portfolio mentors. Teachers claimed that the experience helped them to become more critical of their own practices and increase formal reflection as they improved professional skills and prepared for advanced certifications.

Issues and Limitations

Surprisingly few studies have documented the effects of portfolio practices among beginning and inservice teachers. Typically, available literature describes implementations, student uses, teacher perceptions, and anecdotal benefits of portfolio practices.

Impact. Herman and Winters (1994) noted that presumed portfolio benefits among beginning teachers were largely undocumented. Indeed, most published literature reports on teacher perceptions and implementation rather than impact (e.g., Brennan et al., 1999; Bullock & Hawk, 2001; Pardini, 2002; Viechnicki et al., 1993). Even where more rigorous criteria for documenting and scrutinizing beginning teachers' portfolio processes were applied, the findings focused on perceptions rather than evidence of benefit or impact (Rolheiser & Schwartz, 2001).

Rigor. Advocates report several benefits among beginning teachers, but the presumed benefits of portfolios may well be influenced by a multitude of practices, including mentoring, professional development workshops, orientations, and planning periods (e.g., Kelley, 2004; Rippon & Martin, 2006). In a review of 89 articles spanning ten years of research on portfolio use among inservice teachers, Herman and Winters (1994) noted that inter-rater reliability was examined in only 7 studies and only when training was provided. Additionally, while advocates claim that portfolios are useful for modeling best practices to beginning teachers (Bird, 1990; Wolf, 1991), few studies examine these claims. Indeed, the extent to which experienced teachers model classroom practices through portfolios is often ignored in

portfolio literature or stated as a potential use (e.g.,Frederiksen et al., 1998; Zepeda, 2002). Thus, the presumed impact of portfolios on teacher practice or student learning may prove difficult to detect.

Reflection v. performance. Similar to preservice education, many inservice portfolios employ reflection as an indicator of teacher self-assessment and professional development. Yet, few researchers have examined closely the influence of reflective practices on portfolio development (Zeichner & Wray, 2001). Orland-Barak (2005), for example, compared reflective statements made by 20 inservice mentors who assessed portfolios summatively with 12 that assessed portfolios formatively. When comparing levels of reflection (Hatton & Smith, 1995), both groups' reflections provided mainly basic description. Thus, while formative portfolios helped to describe classroom phenomena, they did not stimulate inservice teachers to consider alternative explanations, base outcomes on relevant evidence, or examine teaching practices through social, political, or cultural perspectives.

Although reflection has been touted both as the backbone of portfolio practices and has been widely embraced among pre- and inservice teachers, written reflection may be inconsistent with expectations for teacher performance and practice in everyday school settings. Burroughs (2001) suggested that such portfolios better represent writing ability than teaching ability. Additionally, Burroughs contended that teachers are rarely guided in developing reflection papers. In effect, classroom practices may be better documented via portfolios that emphasize teaching activity and student learning.

Time and resources. Beginning teachers have reported that portfolios were time consuming to maintain (see, for example, Pardini, 2002). In Viechnicki et al.'s (1993) study, for example, teachers constructed and stored a portfolio for each student in their class, reducing time and resources available from primary teaching activities. Vavrus and Collins (1991) estimated that each portfolio element took an average of 10 hours to complete, underscoring concerns over time and resource requirements. Similarly, Miller, et al (2002) estimated that portfolio evaluators required a minimum of 30 hours of training to provide reliable and valid assessments. Robinson (2005) stated that portfolio reviewers required 50 hours of training. Portfolio mentors then spend considerable time observing and supervising teachers, as well as planning, modeling, and analyzing evidence in order to evaluate portfolios. Portfolios submitted for

professional certification can also prove costly and time intensive to develop and refine (NBPTS, 2007b, 2007c). Given the limited evidence regarding benefits, time and resource requirements of both beginning teachers and their support personnel have been questioned (Delandshere & Petrosky, 2004).

Compatibility. While some have suggested that preservice teacher portfolios are either unsupported or require considerable alteration to continue during inservice teaching (e.g., Adams & Krockover, 1999; Simmons et al., 1999), Johnson, Mims-Cox, and Doyle-Nichols (2006) recommended that beginning teachers retool preservice portfolios to support inservice practices. They suggested that beginning teachers seek out "critical friends" (p. 176), define professional goals, and engage in reflective practices to facilitate this transition. While this may indeed be desirable, Grant and Huebner (1998) found that teachers reported several problems in attempting to do so. Reflective practices decreased dramatically; some participants engaged in only mental reflections and others attached brief descriptions to artifacts. Although they continued collecting student work samples, participants rarely concentrated portfolio production in professional development.

School politics, policies, and culture may also influence portfolio use. Participants who attempted to continue portfolio practices beyond preservice indicated they received little support from principals and administrators (Rolheiser & Schwartz, 2001). Orland-Barak (2005) suggested that school systems discourage self-assessment and reflective practices advocated through portfolio development, arguing that teachers are neither trained in higher-order reflection nor encouraged to engage them during classroom instruction. Because schools do not support these processes, few inservice teachers develop the requisite skills, thus decreasing the value of portfolio practices. Additional barriers are apparent when responsibilities or assignments change. In Pardini's (2002) study of state-mandated portfolio implementations among second-year teachers, difficulties arose as teachers moved to new schools, changed grade-levels, or enrolled in graduate degree programs after their first year teaching. Transitions seemingly altered climate, support structures, and objectives, making previous work difficult to sustain or incompatible with evolving practices and requirements.

Portability. Professional standards and artifact requirements differ from organization-to-organization and school-to-school, requiring continual modification to existing portfolio structures and procedures. Fallon and Watts (2001, p. 53) described as "bulky" the formative assessment portfolios used by preservice teachers, requiring "milk crate" containers to accumulate artifacts. Such storage requirements may make portfolio portability and re-organization difficult and costly. Some artifacts may require physical restructuring and relocation to fit within new portfolio guidelines. Others (e.g., videotaped classroom implementations, student work samples, audio recordings) may be difficult and costly to reproduce—limiting the degree to which the portfolio can be shared with others for feedback and support purposes (e.g., NBPTS, 2007c). Continual reorganization increases the time and resource requirements to implement portfolio practices at a time when teachers often struggle to address classroom procedures and policies and school or district politics.

In summary, traditional formative portfolios have been criticized for placing undue demands on educators already busy addressing classroom responsibilities, policies, and procedures, requiring teachers to restructure existing portfolios to meet institutional requirements, and limiting portability and use because of their bulky, paper-based nature. Although researchers have asserted that formative portfolios help inservice teachers engage in authentic assessments, make their classroom practices more visible to mentors and support personnel, facilitate collaboration, and promote self-assessment and skills acquisition, little research is available to support these claims.

<center>Emergence of Electronic Portfolios: Promise and Performance</center>

Fueled in part by the National Council for Accreditation of Teacher Education (NCATE) and Preparing Tomorrow's Teachers to use Technology (PT3) grants, teacher education programs throughout the United States have transitioned to electronic portfolios (eportfolios) to document preservice teacher knowledge (Gatlin & Jacob, 2002; Hall, Fisher, Musanti, & Halquist, 2006; Strudler & Wetzel, 2005), instill technology skills among their students (Keefe, Kobrinski, Mattia, & Moersch, 2002 ; Wright, Stallworth, & Ray, 2002) and address accreditation requirements (Dhonau & McAlpine, 2005; NCATE, 2005, 2006).

<center>26</center>

Storing and Transporting

While traditional portfolios required considerable resources to maintain and store (e.g., Fallon & Watts, 2001), eportfolios comprise digital (or digitized) artifacts stored via computer media (e.g., flash drives, DVD-ROMs, or the Internet). Thus, eportfolios can minimize clutter and management concerns associated with physical artifact storage (Strudler & Wetzel, 2005). Digital formats also facilitate the capture, organization, and management of multimedia artifacts such as audio, video, graphics, and text within the same system. Eportfolios can also support non-linear organization and navigation.

Additionally, because eportfolios contain collections of computer files, duplication and dissemination can be accomplished readily and at minimal expense. Teachers can duplicate an eportfolio and disseminate via email, file transfer protocol, or traditional methods. Rapid replication allows teachers to tailor portfolio copies to specific purposes and reduce tensions that may arise through differing formats and organization. Some eportfolio systems feature data-base driven architectures that facilitate retrieval and comparison across time and portfolio creators (e.g., Evans et al., 2006; Strudler & Wetzel, 2005), believed to facilitate self-assessment and reflection throughout career development (Plater, 2006).

Scaffolding Development and Use

Although eportfolio systems range from simple constructions using familiar applications (e.g., Microsoft PowerPoint, web site design tools) to data-based institutional systems such as LiveText, most streamline production through template-based layouts, embedded instructions, reflection questions, and related support (e.g., Land & Zembal-Saul, 2003; Whipp, 2003). Shepherd & Hannafin (2007) found that eportfolio templates reduced both time and technology skill requirements for portfolio design, provided common contents and organization across preservice teachers, and facilitated feedback. Tutorials and embedded prompts provided preservice teachers just-in-time support used to reflect on targeted criteria. Land and Zembal-Saul (2003) reported benefits of reflection prompts when preservice science teachers explored and documented their understanding of principles of light. Scaffolding questions helped most preservice teachers focus on specific properties of light and refine their content knowledge.

Promoting Collaboration Among Stakeholders

Eportfolios are believed to facilitate communication and collaboration between and among teachers, mentors, and administrators. Some applications (e.g., LiveText, TaskStream) provide tools that allow reviewers to examine and provide feedback related to specific sections contained within an individual's eportfolio. Eportfolios may also capture changes to portfolio documents, provide discussion boards or hyperlinks to blogs where reviewers can leave comments and feedback, and track the evolution of thought and development among teachers and support personnel (Banister, Vannatta, & Ross, 2005).

Zepeda (2002) conducted a two-year case study examining the influence of eportfolios on collaboration among 4 beginning and 18 experienced elementary teachers. She reported that eportfolios helped supervisory groups reflect on classroom practices, focus meeting topics and discussions, increase collaboration, model best practices, and conduct action research. Similar findings have been reported with eportfolio use among beginning and experienced teachers and administrators. According to Shepherd, Hannafin, and Recesso (2007), Web-based tools that synchronized annotations and comments with captured classroom video helped participants to examine their teaching, communicate and share ideas, and identify standards-based practices.

Fostering Technology Literacy

Similar to findings for traditional portfolios, researchers have reported that eportfolios foster reflective, pedagogical, and content area skills (Zembal-Saul, Haefner, Avraamidou, Severs, & Dana, 2002). Preservice science teachers who documented teaching philosophies in eportfolios and gathered evidence to warrant their claims focused more on student thoughts and mental engagement (Avraamidou & Zembal-Saul, 2003). In addition, eportfolio use has also fostered technology literacy among preservice teachers. Using pre-post surveys across two semesters, Wilson et al. (2003) reported that eportfolio construction helped participants to both manage databases and use video editing software, digital cameras, scanners, and related equipment. Preservice teachers also attributed greater confidence in their use of technology for teacher-related purposes to confidence developed eportfolio development. Based on preservice teacher ratings on the Levels of Technology Implementation (LoTi) survey, Keefe et al. (2002)

concluded that eportfolio construction affords preservice teachers opportunities to experiment with and employ computer applications as they generate artifacts and judge their merit.

Issues and Limitations

Despite reported benefits, several limitations attributed to traditional portfolios exist with eportfolios. Eportfolios also present unique computer challenges, including storing and retrieving, increased extraneous cognitive load, reliance on additional support during development and use, and limited artifact analysis.

Reliability and validity. Similar to paper-based portfolios, researchers have rarely examined the reliability and validity of eportfolios to document current practices and predict future success (Burns & Haight, 2005; Zeichner & Wray, 2001). Additionally, few researchers have examined concurrent, predictive, or discriminant validity in eportfolio development. Burns and Haight (2005) examined the inter-rater reliability and validity using eportfolios developed over two years by 199 preservice special education teachers. They found high inter-rater reliability (.91) as well as moderate predictive and concurrent validity coefficients (.53 and .60 respectively), but noted that substantial training was required. Apart from this isolated study, researchers have rarely assessed the effects of sustained eportfolio use on teacher development or student achievement.

Hardware requirements. Given the digital nature of eportfolios, required computer technologies may be unavailable or costly. While reflections, lesson plans, and teaching resources can be created in electronic formats and be readily uploaded into eportfolios, student work samples (especially in primary grades) often are not. Thus, digital cameras, flatbed scanners, and other equipment may be required to capture these artifacts, adding additional cost, effort, and training requirements to use these tools.

Training. Despite the ability to customize eportfolio formats, provide scaffolding, and support development, research suggests that support personnel and coaches are often needed for successful implementation. For example, although most preservice science teachers used question prompts and eportfolio artifacts to inquire into principles of light and deepen their understanding of the subject, one group continued to base subsequent inquiries on faulty conclusions (Land & Zembal-Saul, 2003). The

researchers concluded that eportfolios only facilitate skills development when participants have sufficient background knowledge, are able to accurately self-assess, and receive consistent and timely feedback.

Additionally, eportfolio reviewers require training to assess comments and provide constructive feedback. Indeed, training requirements may increase when reviewers are unfamiliar with required technology skills and computer applications. Zepeda (2002) found that eportfolios fostered collaboration and action research, but noted that peer coaching was essential for success. Several non-participating teachers complained that eportfolio development reduced the time and resources available to address other important activities.

Cognitive demands. While eportfolio development can require technology expertise, the cognitive load associated with their use can be considerable. Computer-based technologies, for example, reportedly overtaxed the cognitive abilities of college-level students (Song, Singleton, Hill, & Koh, 2004). Hill and Hannafin (1997) asked 15 pre and inservice teachers to locate content and grade-appropriate Internet resources on a subject of their choosing. They found that participants with previous Internet search experience were most successful regardless of their prior teaching experiences or content familiarity. Similar problems were reported by Shepherd & Hannafin (2007) when implementing inquiry-based portfolios among preservice social studies teachers. Although participants were trained in portfolio applications prior to development and received tutorials and one-on-one help with artifact formatting and conversion, many were initially overwhelmed with technology requirements given their student teaching demands and other professional responsibilities.

Artifact selection and use. Similar to traditional portfolios, eportfolio researchers have reinforced the importance of reflection for professional development and inquiry (e.g., Johnson et al., 2006; Strudler & Wetzel, 2005; Zembal-Saul et al., 2002). Some eportfolios included question prompts and scaffolding to focus teacher reflection and examine specific aspects of classroom practice. Indeed, reflection is thought to reveal the underlying reasoning for artifact selection and purpose, clarify classroom context, and make teacher analyses and decisions visible to others for critique and review (Bullock & Hawk, 2001).

Yet prompting and commenting may be insufficient to generate artifacts or support classroom assessments. Land and Zembal-Saul (2003) found that preservice teachers lacked the skills needed to accurately assess their practices. Carver and Katz (2004) and Rippon and Martin (2005) described similar concerns among beginning and inservice teachers who were unfamiliar with personal inquiry. Indeed, they questioned whether beginning teachers had sufficient background knowledge and teaching experience to identify critical classroom practices needing refinement. They further questioned experienced teachers' abilities to identify these practices when unfamiliar with grade-level or new content areas.

Sharing and managing. While eportfolios are believed to facilitate dissemination and review through near instantaneous replication and file transfer, reviewers require access to and facility with computer applications to eportfolios to analyze and record their comments and assessments (Barrett, 2000). Portfolio goals and purposes often vary between teaching institutions. Many teacher education programs rely on eportfolios for accreditation purposes (e.g., Dhonau & McAlpine, 2005; Gatlin & Jacob, 2002). Such requirements demand eportfolio systems that may be unnecessary or largely irrelevant to the needs of practicing teachers.

Eportfolio applications may also complicate artifact sharing and management. Banister et al. (2005) noted that while three eportfolio applications stored artifacts, they were unable to display them, requiring reviewers to download artifacts and open them with the original applications used to create them. Several applications limit the size, duration, and dissemination of teacher portfolios, limiting the utility of eportfolios. Johnson et al. (2006) suggested that eportfolios must be altered between preservice and inservice teaching to align them with immediate requirements and uses. When eportfolio requirements, structures, and systems vary across institutions, adaptations and alterations may become time consuming and impractical.

<div align="center">Unresolved Issues and Concerns</div>

Several concerns and needs have become apparent in attempts to advance portfolio research, theory and practice throughout teacher development.

Extending Across Teacher Development

Advocates suggest that portfolios enable tacit teaching practices to become increasingly visible to teachers, teacher educators, mentors, and support personnel. Portfolios have been used both formatively and summatively to assess progress at various time points during the teaching career as well as to facilitate program accreditation, graduation and initial licensure, teacher induction, mentoring, and advanced certification. It is surprising, therefore, that portfolios have been studied and used in relative isolation. Many reports focus on preservice teacher portfolios to facilitate reflection, for example, but rarely examine sustained effects or uses during induction and inservice teaching. Presumably, assessment of one's progress is critical throughout the teaching career. Although isolated study enables researchers and practitioners to examine specific portfolio processes, it may provide incomplete and misleading indications of the sustainable potential or actual use in practice.

Sharing Practices Across Stakeholders

The ability to share practices for peer feedback, review, and modeling may foster joint collaboration and inquiry that is otherwise impractical. Well-structured portfolios store and share personal and institutional knowledge and act as tools to create and refine knowledge as the artifacts are subsequently analyze to inform practice. Artifacts may be shared beyond the individual teacher's classroom to compare with the portfolio practices of peers and examine teaching phenomena beyond subjective recollection. Assertions and claims can be weighed against supporting evidence to verify or refute conclusions. Similar explorations may extend to include teacher preparation programs, local schools and school districts, and professional organizations.

Despite apparent potential, few researchers have examined portfolio uses between, among, or across stakeholders. Where some researchers have examined continued portfolio use among beginning teachers (e.g., Grant & Huebner, 1998; Rolheiser & Schwartz, 2001), the practices were not supported within school settings—even when valued and used during preservice preparation by teacher education programs and prospective teachers. Research is also needed to study interactions between teachers who continue portfolio development and those beginning the process. Although differences exist in the

duration of implementation, spanning from a single semester (e.g., Borko et al., 1997; Green & Smyser, 1995; Naizer, 1997; Orland-Barak, 2005) to several years (e.g., Brennan et al., 1999; Fallon & Watts, 2001; Wetzel & Strudler, 2005), use or impact across teaching stages is rare. If portfolios are to become sustainable tools for teacher development, longitudinal research is needed to examine their use as prospective teachers transition and mature in the teaching profession, to examine how portfolio goals and objectives change over time, and how such changes can be best supported.

Articulating Priorities Between and Among Systems

Even when supported within school systems, Johnson et al. (2006) noted that considerable alterations in portfolio practices are often necessary. When different portfolio systems are used among institutions, users need to modify contents in accordance with local policies, standards, and procedures, or abandon previous systems altogether. Ironically, changes may be required as teachers negotiate new classroom settings, subject matter, shifts in local politics and policies, and efforts to establish local support networks. When teacher education programs recognize local school systems' eportfolio tool sets and requirements, they may devise similar tools that better support the transition from preservice-to-inservice education. For example, the induction requirements of local and regional schools, such as mastery of state standards using specific portfolio activities, could become integral to the teacher education portfolio. In effect, portfolio accountability and growth requirements deemed relevant during preservice education and beyond graduation could be projected and monitored from the outset, thereby distributing parallel structures and uses across organizations. The sharing of portfolio tools and requirements between schools and teacher education institutions may foster collaborative portfolio development and interaction among prospective, beginning, and experienced teachers and administrators, and teacher education faculty. Research is needed to identify approaches that promote collaboration and scaffold eportfolio development while addressing the unique needs and concerns of each stakeholder.

Enhancing Functionality, Usability & Sustainability

Currently, typical portfolios offer support for artifact examination and inquiry, such as scaffolding within eportfolio templates (Borko et al., 1997; Land & Zembal-Saul, 2003). Likewise,

tutorials, grading rubrics, questionnaires, and instructions or protocols are sometimes embedded within

portfolios to support documentation and analysis of teaching practices. Yet, nominal support may be

insufficient to accurately examine teaching over time or identify where just-in-time support in needed

(Aleven, Stahl, Schworm, Fischer, & Wallace, 2003). Indeed, users often require considerable support in

learning to focus their analyses, triangulate findings, and compare artifacts to warrant claims (Borko et

al., 1997; Land & Zembal-Saul, 2003). According to Zeichner and Wray (2001), "a closer study of the

nature and quality of this reflection is needed" (p. 619). Portfolio templates and prompts should help users

articulate portfolio purposes, assess the relevance of past entries for further examination, indicate why

additional artifacts are included and their intended purposes in recreating or depicting classroom

experiences, and identify analysis procedures. In turn, they also need to document results from

examinations, plans for change, and how changes influenced future practices.

Supporting Flexible, Adaptable and Customizable Use

While paper-based portfolios are alleged to be limited in displaying multiple artifacts or filtering

and displaying artifacts non-linearly, similar issues have surfaced with eportfolios. Presumably,

eportfolios enable users to visualize and analyze multiple artifacts and resources, provide guidelines and

tools for users to highlight specific portions of their artifacts, and clarify evidence associated with

decisions upon which they are based. Given the goal to promote self and collaborative inquiry across the

teaching profession, tools are needed that allow users to develop and implement their own assessment

criteria as well as expand, narrow, or refine those criteria to support investigation. While these processes

are rare among eportfolio applications, they are common place within current desktop search and

qualitative research software (e.g., Spotlight, Google Desktop, Atlas Ti, NVivo).

Promoting Collaborative Discourse

Because sustained portfolio practices have the potential to influence collaboration and inquiry,

tools are needed to both manage and facilitate joint explorations, such as distinguishing individual from

group tags, comments, and conclusions and managing artifact uses and alterations. Several qualitative

analysis tools allow multiple users access to common artifacts. Using similar tools, eportfolios could

facilitate collaboration and sharing within a common system, improve data organization, augment analysis, synthesize evidence over time, and distinguish relevant from irrelevant artifacts during inquiries. Research is needed to identify the tools needed to sustain portfolio development as well as to minimize stakeholders' work load.

Managing Development, Implementation and Maintenance

When portfolio procedures or requirements are complex, the additional time, cognitive demands, and resources required to use them lessens their probability of use (Anderson & DeMeulle, 1998; Fallon & Watts, 2001; Reis & Villaume, 2002). Few guidelines exist or studies have been conducted to document the extent to which artifacts capture, represent, or recreate classroom phenomena. Because evidence cannot completely recreate classroom practices (Anderson, Schum, & Twining, 2005), practical constraints need to be weighed.

Establishing the "Evidential Force" of Artifacts

Although the force of evidence—relevance, credibility, forms—is scrutinized in judicial research and practice (e.g, Anderson et al., 2005; Schum, 1994), it is rarely weighed systematically when examining or using teaching artifacts (Heller, Sheingold, & Myford, 1998; Vavrus & Collins, 1991). In courts of law, for example, each piece of evidence is weighed in relation to each other by its relevance to the case, ability to recreate experiences, and credibility (among other things). Finger print and DNA evidence, for example, may provide more accurate and credible information about participants in a crime than witness testimony, especially if the witness was inebriated or a known habitual liar. Similarly, some artifacts may more accurately and forcefully recreate teaching experiences than others. Research is needed to determine the minimal and optimal quantity, quality, and variety of portfolio artifacts required or desired to facilitate collaboration, inquiry, and review (see Vavrus & Collins, 1991). Which artifacts are most powerful, useful, and practical for which purposes? What is the relative value of capturing and analyzing video of classroom practices compared with observer ratings, teacher recordings, student work samples, lesson plans, and detailed reflections? Which portfolio scaffolds improve teachers' focus on important aspects of their artifacts and base decisions on evidence? When should portfolio activities be

introduced, refined, and expanded? What function can (or do) mentors play in sustaining portfolio development throughout the teaching career?

Impacting Teacher and Student Learning and Performance

Finally, while many studies document implementation strategies or the theoretical bases, research is needed to examine portfolio impact on teacher learning and performance, and ultimately student learning and development. Although researchers have asserted that portfolios help teachers to develop technological, pedagogical, and content-knowledge skills, become more reflective, and self-assess, it is unclear how or if these assertions can be substantiated or affect teacher practice sufficiently to influence student learning. In a political climate dominated by emphases on student achievement gains and teacher accountability (Cochran-Smith, 2005), we need to demonstrate how, if, and under what circumstances portfolios influence both classroom practices and student learning.

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	Claims	Evidence
Preservice	*Foster holistic assessment:* Portfolios provide richer evidence of classroom practices than traditional assessments because they capture classroom practices (e.g. Barton & Collins, 1993; Bird, 1990; Conderman, 2003; Kenney & LaMontagne, 1999; Loughran & Corrigan, 1995; Wolf, 1998).	Although Burns and Haight (2005) and Nazier (1997) demonstrated inter-rater reliability and concurrent and predictive validity, most research fails to examine these issues (Haertel, 1991; Zeichner & Wray, 2001) or fails to replicate these findings (e.g., Delandshere and Arens, 2003; Tillema & Smith, 2007).
	Promote self-assessment: Portfolios improve reflective practices through artifact collection and examination (Bullock & Hawk, 2001; Richert, 1990; Wade & Yarbrough, 1996) and help to focus personal inquiry and reflection (Borko et al., 1997; Land & Zembal-Saul, 2003; Whipp, 2003),	Most researchers focused on perceptions of preservice teachers and faculty without addressing impact (e.g., Borko et al., 1997; Carroll et al., 1996; Meyer & Tussin, 1999; Reis & Villaume, 2002; Willis & Davies, 2002; Wright et al., 2002). However, a few studies found that embedded question prompts increased the quality of reflective practices (Avraamidou & Zembal-Saul, 2003; Whipp, 2003).
	Foster skill acquisition: Portfolio practices are believed to increase technology skills (Keefe et al., 2002; Wilson et al., 2003), promote inquiry and action research (Grant & Huebner, 1998; Zembal-Saul et al., 2003), and develop pedagogical and content knowledge skills (Green & Smyser, 1995).	Most studies indicate that substantial coaching or mentoring is required for skills acquisition (Borko et al., 1997; Carroll et al., 1996; Land & Zembal-Saul, 2003; Zembal-Saul et al., 2002) or provide additional classroom supports that may confound gains (Green & Smyser, 1995; Wilson et al., 2003).
	Time and resource intensive *Creators and reviewers indicate that portfolios take considerable time to construct and assess (Borko et al., 1997; Reis & Villaume, 2002).*	Portfolios require considerable time to create (Fallon & Watts, 2001; Strudler & Wetzel, 2005) and review (Anderson & DeMeulle, 1998). They may also require technologies that increase training time, are minimally available, and increase cognitive demands (Hill & Hannafin, 1997; Keefe et al., 2002)
	Promote lifelong learning: Portfolios may be useful beyond graduation for employment and professional development (Borko et al., 1997; Keefe et al., 2003)	Portfolios (especially paper-based) may be cumbersome to store, replicate, and share (Fallon & Watts, 2001). Few studies follow portfolio development into induction and inservice teaching (Shepherd & Hannafin, 2007; Grant & Huebner, 1998; Maurice & Shaw, 2004; Roheiser & Schwartz, 2001). Induction requirements and school, subject, and grade-level changes may alter portfolio practices (Pardini, 2002), and schools may not support portfolio development (Grant & Huebner, 1998; Orland-Barak, 2005).

Table 2.1: Summary of claims and evidence related to formative assessment portfolio applications

	Claims	Evidence
Inservice	*Foster mentoring & induction:* Portfolios provide context for discussion and review among beginning teachers and their mentors (Kelley, 2004; Wolf et al., 1995). They help mentors to analyze and model their own practices (Pardini, 1999; Miller et al., 2002) *Promote skill acquisition:* Portfolios promote inquiry and goal formation (Sustain & Potts, 1998) and foster reflective practices among teachers and mentors (Orland-Barak, 2005; Thompson, 2002) *Examine student learning:* Portfolios allow teachers to closely examine student practices to inform decisions (Gearhart & Herman, 1998; Rolheiser & Schwartz, 2001; Viechnicki et al., 1993) *Cognitive demands:* Development may tax user abilities at times when teachers are held accountable for content mastery and student achievement (Cochran-Smith, 2005; Zepeda, 2002).	Frederikson et al. (1998), Sherin and Van Es (2005), and Zepeda (2002) found that constructing and examining video-based portfolios helped teachers review and discuss classroom experiences and reflect on their own teaching. However, little research has addressed if and how portfolios facilitate modeling best practices among mentors or joint exploration into teaching phenomena. Most research focuses on implementation strategies (e.g., Bullock & Hawk, 2001; Miller et al., 2002; Pardini, 2002) and perceptions (Heller et al., 1998; Jun et al., 2007) rather than impact. Additionally, while some studies found that portfolio practices facilitated reflection and inquiry skills (Zepeda, 2002) other researchers failed to identify these benefits (Adams & Krockover, 1999; Orland-Barak, 2005; Rolheiser & Schwartz, 2001; Simmons et al., 1999). Reported gains may also be confounded with other professional development methods (Brennan et al., 1999; Orland-Barak, 2005; Zepeda, 2002). Although portfolios allow for the collection, organization, and reflection of student work, little research has looked at the effects of teacher portfolios on student achievement or performance—focusing instead on student portfolios (e.g., Barootchi & Keshavaraz, 2002; Ellsworth, 2002, Herman & Winters, 1994).

Table 2.1: (continued)

CHAPTER 3

EXAMINING PRESERVICE TEACHER INQUIRY THROUGH VIDEO-BASED, FORMATIVE

ASSESSMENT ELECTRONIC PORTFOLIOS[2]

Background

Since the mid 1980s, teacher educators have used portfolios to document teacher practices, facilitate self-study, promote formative and summative assessment, develop pedagogical skills, and stimulate reflection (Bird, 1990; Linn, Baker, & Dunbar, 1991; Wolf, 1991). By collecting artifacts—often including written reflections aligned to professional standards—preservice teachers articulate their beliefs about teaching, current classroom practices, and teaching skills. Within the past decade, many programs transitioned from paper-based to self-contained, electronic portfolios for data storage and retrieval, program accreditation (Evans, Daniel, Mikovch, Metze, & Norman, 2006; Strudler & Wetzel, 2005).

While several portfolios have been described (e.g., Barton & Collins, 1993; Sherman, 2006; Zeichner & Wray, 2001), most focus on summative assessments (Conderman, 2001; Grossman, 2005) that document teacher practice and beliefs but do not promote professional development or foster sustained inquiry. Formative assessment portfolios, in contrast, are designed to facilitate professional growth (Land & Zembal-Saul, 2003; Theel & Tallerico, 2004), enhance reflection (Avraamidou & Zembal-Saul, 2003) and improve practice over time. Some portfolios, for example, have helped preservice teachers to reflect on authentic experiences, identify strengths and weaknesses in their teaching, and implement changes in practice (Johnson, Mims-Cox, & Doyle-Nichols, 2006; Loughran & Corrigan, 1995).

Yet, few researchers have examined how formative portfolios influence preservice teachers' decisions (Orland-Barak, 2005; Zeichner & Wray, 2001) or are used beyond graduation. The purpose of this paper is to examine the influence of systematic analysis of formative eportfolios on preservice teachers' perceptions and decisions regarding classroom practices and use following program completion.

Summative Assessment Portfolios

Typically, portfolio development literature focuses on summative assessment (e.g., Burroughs, 2001; Dhonau & McAlpine, 2005; Gatlin & Jacobs, 2002; Nazier, 1997; Reis & Villaume, 2002) that ''stimulate preservice teachers' reflections on their development, as well as to assess that development,

often in a summative way" (Grossman (2005, p. 443). They often document mastery of specific skills, course objectives, or professional standards at a single moment in time. As part of an "exit portfolio," for example, preservice teachers included resumes, classroom management plans, assessment instruments, self-evaluations, lesson plans, and reflections during a ten-week field experience (Reis & Villaume, 2002, p. 11). The portfolios were evaluated by faculty at the end of the semester to assess accomplishments. As part of a capstone project, Conderman (2001, 2003) documented similar procedures, where preservice teachers gathered artifacts related to their teaching and organized them around state-mandated standards. Findings indicated that portfolios helped preservice teachers reflect on their teaching using professional standards, plan and organize resources, and prepare for job interviews.

However, when mandated for summative assessment purposes, portfolios may paradoxically minimize preservice teachers' engagement. In studies conducted by Wade and Yarbrough (1996) and Carroll, Potthoff, and Huber (1996), researchers found that preservice teachers became frustrated, claiming that the portfolios did not accurately represent themselves as teachers. Other researchers found that summative assessment portfolios were viewed as course projects or means for graduation rather than as tools to organize resources, promote reflection, and document mastery (Loughran & Corrigan, 1995).

Formative Assessment Portfolios

Recently, portfolios have been advocated for professional growth purposes, documenting content and pedagogical skills acquisition, self assessment, and reflection, suggesting that portfolios promote growth over time and facilitate inquiry into practice (Evans et al., 2006).

Improving reflection. Most research on formative portfolios focuses on strengthening reflective practice through question prompts and faculty feedback (Avraamidou & Zembal-Saul, 2003; Borko Michalec, Timmons, & Siddle, 1997; Fox, Kidd, White, & Painter, 2005). Although many definitions exist (e.g., Johnson et al., 2006; Van Wagenen & Hibbard, 1998; Whipp, 2003), for purposes of this paper, reflection involves identifying an interest or problem related to an individual practice, hypothesizing reasons for its occurrence, obtaining and analyzing information related to the practice, and implementing changes based on evidence (Dewey, 1933; Hatton & Smith, 1995). Richert (1991)

suggested that reflective practices are facilitated by collecting artifacts that capture teaching details often overlooked "in action." During a semester-long field experience, Borko et al. (1997) reported that preservice teachers who collected and reflected upon both course mandated and self-selected portfolio artifacts using question prompts reacted positively to the prompts, and stated that portfolios facilitated reflection and prepared them for future employment.

Promoting content knowledge. Avraamidou and Zembal-Saul (2003) found that eportfolios helped participants' to examine their teaching, develop content knowledge, and improve pedagogical skills. Preservice science teachers developed teaching philosophies that included 3-4 claims about how students learn; evidence and reflection were used to warrant claims. Researchers reported that eportfolios helped sensitize preservice teachers to student thought, recognize the need for physical and mental engagement to foster learning, and support claims with evidence.

Yet, literature has been inconclusive regarding the extent to which preservice teachers collect and reflect on artifacts to inquire into teaching practices. Delandshere and Arens (2003) questioned whether they selected artifacts to support existing ideas or to inform current practices. Additionally, they reported that faculty often failed to identify connections between portfolio artifacts and the standards they purported to represent. Land and Zembal-Saul (2003) noted that while working in small groups, preservice teachers examined properties of light using classroom experiments and eportfolios. Although most formalized properties of light through experimentation and eportfolio production, others relied on erroneous prior information included within eportfolios even when evidence contradicted it.

When artifacts are selected to justify claims rather than to inquire, portfolio benefits may be minimized. In a review of three elementary education programs, Delandshere and Arens (2003) found that faculty used portfolios to document program effectiveness while preservice teachers them for presentations and employment. Borko et al., (1997) reported similar conflicts: Although preservice teachers perceived portfolios as a tool to facilitate reflection, they concentrated on presenting themselves favorably to future employers.

This study examined how eportfolios influenced preservice teacher inquiries into their classroom practices through the systematic analysis of artifacts. Particularly, we examined the extent that artifact analysis modified perceptions of classroom instruction, documented reasoning, and facilitated classroom practice.

Methods

Setting and Procedure

Since 2003, each preservice social studies teacher at a large southeastern US university created an eportfolio during a capstone seminar taken concurrently with a 12-week field experience; Eportfolios were housed in LiveText (a Web-based, commercial eportfolio system). Historically, eportfolios included a teaching philosophy, resume, artifacts (e.g., lesson or unit plans, student work samples, assessments, pictures), and reflections regarding mastery of state teaching standards. Eportfolios were also used to document teaching milestones for National Accreditation of Teacher Education (NCATE) and to stimulate reflection regarding the alignment and disparities between classroom teaching practices and rationales. Despite assignments involving development throughout the semester, instructors reported that eportfolios were usually constructed during the final weeks of the semester rather than throughout field experiences. Some professors also expressed doubts regarding the use of artifacts within eportfolios, stating that preservice teachers were unable to represent standard proficiencies using one or two artifacts and questioning whether they should be required.

To explore the use of artifacts to inform preservice teacher's reflection and decision making regarding active student engagement in their classrooms, eportfolio requirements were modified during one semester. In addition to previous requirements, preservice teachers conducted three inquiry cycles focused on the systematic and formative assessment of evidence collection and examination (see Figure 3.1). During these cycles, preservice teachers iteratively identified problems, hypothesized and implemented solutions, examined the outcomes of their implementations through the collection and analysis of artifacts, and modified future implementations as needed (Corey, 1953; Johnson et al., 2006; Recesso et al., in press). For each cycle, preservice teachers reviewed suggestions to promote active

50

student engagement, increasing mindful activity by which learners receive, process, manipulate, judge, and/or interpret knowledge to enhance student understanding (Black, Sileo, & Prater, 2000; Dewey, 1933). They either selected and implemented a suggested technique (Appendix A) or chose their own technique based on personal needs, prior inquiry results, and course feedback. Once selected, question prompts within the inquiry cycle (Appendix B) directed them to identify how they would implement the technique in their classroom, collect artifacts to gauge success, hypothesize problems they might encounter, and potential solutions.

While implementing the technique, preservice teachers video recorded and analyzed a minimum of one classroom implementation using the Web-based Video Analysis Tool (VAT). As shown in Figure 3.2, VAT enabled them to examine their own video recordings, locate and tag practices relevant to active student engagement, write reflective comments explaining their decisions, and create hyperlinks within the inquiry cycle. Additional question prompts directed them to select and interpret additional artifacts as well as capture reasoning (see Figure 3.3). These questions probed the extent to which selected techniques differed from traditional practices, alternative hypotheses accounted for findings, and additional artifacts could confirm or refute their claims. At the conclusion of each cycle, preservice teachers proposed future instructional improvements and decided whether to continue focusing on the selected technique during subsequent inquiry cycles or choose a new one.

Initially, changes made to the eportfolio created controversy among some faculty members and seminar support personnel because the eportfolio was perceived as a program requirement and changes deserved discussion and approval from all social studies faculty members prior to implementation. Because the inquiry portion of the eportfolio was part of a research project, they also questioned whether preservice teachers needed to complete it if they refused to participate. Similar sentiments were expressed by some field instructors who supervise preservice teachers during their field experiences. To address these concerns, we clarified that the inquiry portion of the eportfolio only being implemented in one section of seminar for pilot purposes and was a seminar requirement that had been approved by the course instructor (non affiliated with the research project). Data from individual eportfolios was only used for

research purposes with informed consent. Additionally, some preservice teachers lacked initial buy-in to the project because it had not been announced the previous semester during a student teaching introductory meeting, nor appeared in the course syllabus as an eportfolio requirement.

Participants

Seventeen social studies education preservice teachers enrolled in the modified eportfolio course. Although all preservice teachers developed the modified eportfolio throughout the semester, eleven agreed to participate in the research study; five subsequently became ineligible to participate because their schools did not agree to participate in the study. Of the six remaining preservice teachers, three were purposefully selected (Patton, 2002). Two were selected because they exhibited interest in the inquiry cycles and were representative of most students in the course (as indicated through researcher observation and instructor recommendation), and the other based on reluctance to complete the inquiry cycles. Mitch[3] was a male Caucasian in his early 20s and taught in a large urban high school within 40 miles of the university. Wendy was a female African American in her early 20s and Meg was female Caucasian in her 40s, each of whom taught in different rural high schools within 25 miles of the university.

Data Sources and Analysis

At the end of each cycle, we collected participants' eportfolios and interviewed them using a semi-structured protocol to identify perceptions towards formative eportfolio development, rationales for artifact inclusion and analyses, received support, and steps taken for cycle completion (Appendices C and D). We also interviewed the course instructor at the conclusion of the semester to document perceptions towards eportfolio construction (Appendix E). All interviews were audio taped and transcribed verbatim.

Using case-based methods (Yin, 2002), open-coding, and constant comparison (Glaser & Strauss, 1967; Pigeon & Henwood, 2004; Strauss & Corbin, 1990), analysis began immediately following eportfolio training and continued throughout the study. Several concepts and categories were subsequently identified, defined, and refined. Initially, we documented open codes using a Microsoft Excel spreadsheet to examine interviews, and inquiry cycles. Throughout the analysis, we employed

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[3] All names have been changed to protect the confidentiality of participants

constant comparison techniques to refine codes, develop formative concepts, and identify their properties. Data obtained through inquiry cycles were triangulated (Patton, 2002) with participant and instructor interviews (Appendix F).

Findings

Preservice teachers stated that video captured and examined during inquiry cycles helped them to examine current practices from diverse perspectives, draw inferences regarding those practices, and consider additional evidence to strengthen claims. All participants stated that their initial perceptions of classroom implementations changed one or more times through artifact analysis and inquiry development. However, participants identified mismatches between eportfolio development and observed teaching practices and expressed limited interest in using eportfolios beyond graduation. These findings are detailed below.

Evidence Examination

Although approached differently, preservice teachers stated that video artifacts helped them to examine classroom practices from different vantage points, focus on aspects previously overlooked, and refine initial beliefs. For example, during her first interview, Wendy compared video analysis to comments from support personnel.

> When you get field instructor time, that's going through someone else's eyes. The video tape is just raw data. You know, it's not someone else's opinion. It is just the camera focused on picture [the classroom]…And so you can actually see what you did: how many "ums" you said, or how many times you walked around the room; how many times you did whatever. You can also see what the students are doing as well.

By replaying video to observe specific students, identifying attentive and inattentive students, and reviewing her own and others' comments, Wendy re-assessed both her mannerisms (which she had previously overlooked) as well as student reactions to her instruction. During her second interview, Meg observed, "sometimes I distracted myself…I would be watching [the video for attributes of active student engagement] but then I would watch myself and go like 'oh my God, what was I doing there?'" Because

53

the camera showed the classroom from a student perspective, enabling participants to view their own behaviors, each identified particular mannerisms.

Participants then transitioned to focus on student performance (both verbal and non-verbal) to draw conclusions. During his first inquiry cycle, for example, Mitch wrote:

> I don't know if I always allowed enough wait-time for my students to think about the questions, but I do know that…the majority of the class was attentive and seemed to be thinking about the answers…many students would raise their hands to answer the questions or they would tell me the answer once I asked the question…Some of the students were [also] writing questions and answers down on their own paper.

Although Mitch questioned if he allocated enough time for students to formulate responses, he examined student behaviors using video evidence to draw conclusions. Video review also helped participants to consider the needs of students overlooked during teaching. In both interview and inquiry statements, Meg indicated that video "helped me [to pay] more attention to the people who weren't speaking." While facilitating a discussion, she reported "concentrating on who had the dialogue…When I was watching this [video], I concentrated on who didn't have the dialogue." Meg indicated that she could better identify students who did not participate verbally while reviewing video of the discussion.

Wendy also described how artifacts captured within inquiry cycles helped her to reflect on classroom practices and focus on student behaviors and performance. She described herself as a reflective practitioner who frequently used student work to explain classroom phenomena prior to eportfolio production, yet indicated that the inquiry cycles helped her

> to reflect in a different way… [and to] think more about what the students are getting out of what I'm doing because I could actually see them in real time, after the fact, after I've thought about how the lesson went. I could see how they reacted to it [the lesson] from a different perspective.

Student focus alters initial perceptions. All participants stated that the inquiry cycles also helped them to examine and to reformulate initial ideas. Immediately following her first lesson implementation, Meg wrote, "My initial response to the activity, while it was happening, was that it was not at all

54

successful...I didn't think that everybody was involved. She later wrote, "After watching the video, it seemed that the students, even if they were not talking, were interested and paying attention." She concluded that her method was more successful than initially judged based on evidence of student participation identified during video analysis. In contrast, in his first inquiry cycle Mitch initially concluded that his "method was fairly successful in promoting active student engagement." He later wrote:

> Once I viewed my video recording, I realized that I did not really extend wait-time very much for my discussion…I don't know if I really reached as many students as I had wanted. I am glad that I was able to watch myself because I did realize that I did not really allow much more time than normal to answer the questions."

By gathering and analyzing artifacts related to student behaviors, all participants modified initial thoughts regarding lesson implementation during one or more inquiry cycles.

Participant statements also described increased perceptions of success during the semester. During the first inquiry cycle, all participants reported mixed success in promoting active engagement. At the conclusion of her entry, for example, Wendy wrote "I am satisfied with my…method; however, everything needs improvement." Mitch wrote, "I think that I had the right idea …but I need to work on [it] in order to promote more active student engagement." Although they all identified student participation, they questioned if they had adequately implemented their technique, provided ample directions, or reached specific individuals. Meg and Wendy reported similar concerns during their second inquiry cycles. Meg stated "watching the tape, I realized that I just gave up on it [calling on particular students to participate]." Wendy wrote "Essential questions in the way that I framed my class did not go over so well. [My] essential questions seemed more in the vein of unit questions…An essential question should foster discussion." In both cases, reviewing video artifacts helped participants to indicate that they had not implemented their technique as planned. However, within their third inquiry cycles they indicated success. For example, Wendy wrote "My evidence suggests that…essential questions provided a foundation and a sort of rationale for the importance of [my] topic….More students asked questions…and

students had a reason to want to know more." In contrast to her previous inquiry cycle, Wendy indicated that improved essential question quality increased student discussion.

In contrast, Mitch described success in both his second and third inquiry cycles. After implementing essential questions during his second cycle, Mitch wrote "My evidence suggests that asking 'essential' questions seemed to get [students] actively engaged…I am satisfied with this method." Similarly, at the conclusion of his third cycle he wrote "I think my evidence shows that my method of promoting active student engagement [making class content relevant to students' lives] was pretty successful due to the increased responses I got." In all cases, participants initially felt uncertain about the effects of their implementations on active engagement. However, as they continued to enact inquiry cycles throughout field experiences, their perceived success increased.

Limitations of evidence. Although video artifacts influenced preservice teachers' assessments of specific classroom practices, reflective questions embedded within inquiry cycles helped all participants to identify both limitations in existing evidence and additional evidence needed to bolster or refute claims. Eportfolio development through formative inquiry cycles helped Wendy to examine classroom practices using video evidence and to correlate her findings with student performance data. During her first inquiry cycle, Wendy stated, "it is hard to judge whether or not active student engagement really occurs for each individual even with video evidence." Therefore, she decided to use student performance data: "the next day [we] were having a test on the material that…we did this inquiry project on…I hoped that the students would perform well on the test because I utilized smaller groups and extended wait time… [and] a lot of them did better." During her second inquiry cycle, she compared student participation with assignment quality.

Meg and Mitch also identified limitations in video artifacts. When prompted if analysis altered initial perceptions, Mitch wrote: "the video did not do much to support my stance because I was not able to really see my students' faces due to some technical difficulties with the tripod and camera placement." He hypothesized that examining "test scores from their benchmark" might support his claims of engagement because "students knew that this information would be on the benchmark and that the

56

benchmark was an important grade." Meg made similar claims during her second interview. When asked how she examined her video to identify student engagement she stated "it's hard to tell because you can't see that many students on the video." She then hypothesized that "you might tell how effective it was by test scores." However, neither Mitch nor Meg attempted to collect additional artifacts for their inquiry analyses.

Eportfolio Mismatch

While preservice teachers claimed that inquiry cycles helped them to examine classroom practices through artifact collection and analysis, all participants described inconsistencies between preservice and professional portfolio practices. Meg initially questioned whether eportfolios (containing both traditional and formative sections) were useful for potential employers, as some faculty members had suggested: "when we go out and apply for jobs, I haven't seen anyone ask 'let me see your portfolio.'" During her second and third interviews, Meg stated that teachers and administrators at her student teaching placement as well as schools where she applied for employment indicated no use of portfolios in everyday schools. Wendy responded similarly when asked about future uses of her eportfolio. Although mentioning that her eportfolio would help her to obtain employment during her first two interviews, during her third interview Wendy indicated that the teachers she encountered stated "no one looks at your portfolio when you're trying to get a job." Participants also questioned the importance of eportfolios during inservice teaching. Meg indicated that eportfolios facilitated development, but doubted she would continue beyond graduation:

> If I was actually going to use it to get jobs, if people were actually going to look at it when they considered hiring me then it would be useful…You know, you want to continue thinking about it. You don't want to stagnate at some point…I don't see where I will continue to write a portfolio...It's not me and it's not going to happen.

Because they were not considered important within the schools she applied to, Meg stated that she would retain lesson materials and use notes to indicate lesson success and future implementation ideas.

Similarly, Wendy questioned the value of continuing eportfolio practices when not supported within her school. During her final interview she stated:

> To apply the portfolio into real life would be hard because you don't have a reason to do it. I mean it would be great, but who has the time to like work on that kind of stuff…but if you're out in the real world and you're spending all your time planning lessons and stuff like that, remembering to reflect and to document things is going to be a little secondary.

General Discussion and Implications

This study examined the formative use of eportfolios to capture actual evidence of preservice teacher practice, guide reflection related to personal inquiry, and inform teaching decisions regarding active student engagement. We found that eportfolios focused on inquiry facilitated reflection, helped preservice teachers inquire into both perceived classroom successes and failures, examine active student engagement through video evidence, and generate self-improvement plans based on artifact examination. Despite recognized benefits, participants perceived a mismatch between preservice eportfolio production and inservice teaching requirements, questioning their continued use beyond graduation.

Consistent with studies by Avraamidou and Zembal-Saul (2003) and Carroll et al., (1996), eportfolio tasks helped preservice teachers to reflect on current practices. Within inquiry cycles, preservice teachers collected and organized artifacts related to specific methods that helped them to focus on elements of their classroom, identify phenomena previously overlooked, and identify individual strengths and needs. Inquiry tasks also helped preservice teachers to examine classroom practices through multiple perspectives, assess and modify perceptions of effectiveness, examine student behavior more deeply, and guide their decision-making. Using eportfolios to inquire about teaching practices helped preservice teachers both to "make visible" and examine their methods. Within the inquiry cycles reported in this study, participants labeled five of the nine lesson implementations as either moderately or completely unsuccessful. Participants included artifacts and reflections to document accomplishments and needs as well as specific plans to address in subsequent classroom activities. All participants used their

inquiry cycles to examine current practices, hypothesize improvement plans, and draw conclusions with evidence

Current literature indicates that beginning teachers often lack sufficient content knowledge and pedagogical skills to facilitate student learning (Carver & Katz, 2004; Norman & Feiman-Nemser, 2005). Since teacher accountability has been increasingly linked to professional standards and student achievement (Cochran-Smith, 2005), systems are needed that assuage teacher concerns, gather evidence of improvement, and facilitate professional development. This study suggests that eportfolios may become increasingly valuable when they promote inquiry regarding specific classroom phenomena, guide artifact collection and examination, focus on improvement plans, and provide context for iterative examination and revision. However, these improvements were likely also influenced by program practices. Although participants indicated increased successes with technique implementation during later inquiry cycles, they had also gained experiences teaching, and received extensive support through cooperating teacher and field supervisor feedback, seminar discussions, and peer critiques. These support mechanisms seem likely to have influenced how participants conducted inquiry practices, examined evidence, and interpreted conclusions.

Participants also perceived a mismatch between their teacher education eportfolios and the priorities of local schools. While both the Interstate New Teacher Assessment and Support Consortium (INTASC) and the National Board for Professional Teaching Standards (NBPTS) require portfolios for certification purposes, both practicing and preservice teachers did not associate their eportfolio production or evidence-based reflections as being valued in local schools. Although this mismatch appears to stem from the lack of perceived eportfolio practices among preservice teachers generally, it may also have emerged in part due to limited buy-in by support personnel. Participants stated concern over a lack of any portfolio practices among preservice teachers—including those traditionally supported by social studies faculty and support personnel. Additionally, one participant was selected because he exhibited minimal buy-in to inquiry processes during the early implementation stages. If eportfolios are to become tools for improvement via formative assessment and professional development, stronger connections are needed

between and among teacher educators, local school systems, and induction program personnel as to their use and value.

Research is needed to examine the longitudinal use and impact of eportfolios as teachers transition from preservice to induction programs within local schools. To facilitate eportfolio development beyond graduation and encourage collaboration with local schools, teacher educators and school personnel need to better communicate shared eportfolio goals and methods while addressing the priorities and goals of each. Formative eportfolios might facilitate mentoring by enabling the capture and examination of teaching practices, documenting decision-making processes for professional development purposes, sharing best practices, and building sustainable learning communities.

Researchers and practitioners have also expressed concerns over the time required for formative eportfolio development (Borko et al., 1997; Delandshere & Petrosky, 2004). However, Sherin and Van Es (2007) reported benefits when teachers video recorded, shared, and examined even brief clips of a few minutes in duration. However, we have rarely examined which artifacts to include in formative eportfolios, or which combinations of artifacts best support specific analyses or decisions. Rather, teachers are provided little guidance as to which aspects of their practice to address and analyze. Because the collection, organization, and interpretation of artifacts for professional development purposes is time and resource intensive, research is needed to clarify the types and quantities of artifacts needed to inform classroom practice.

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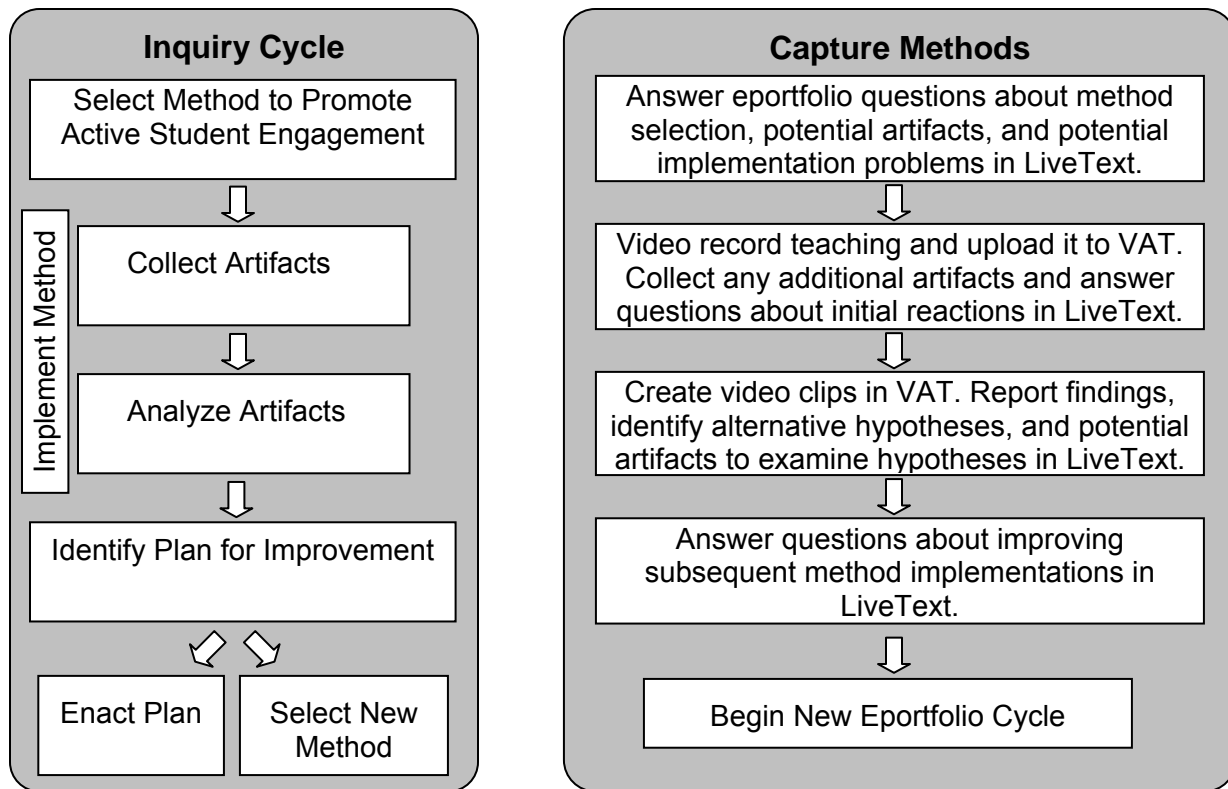
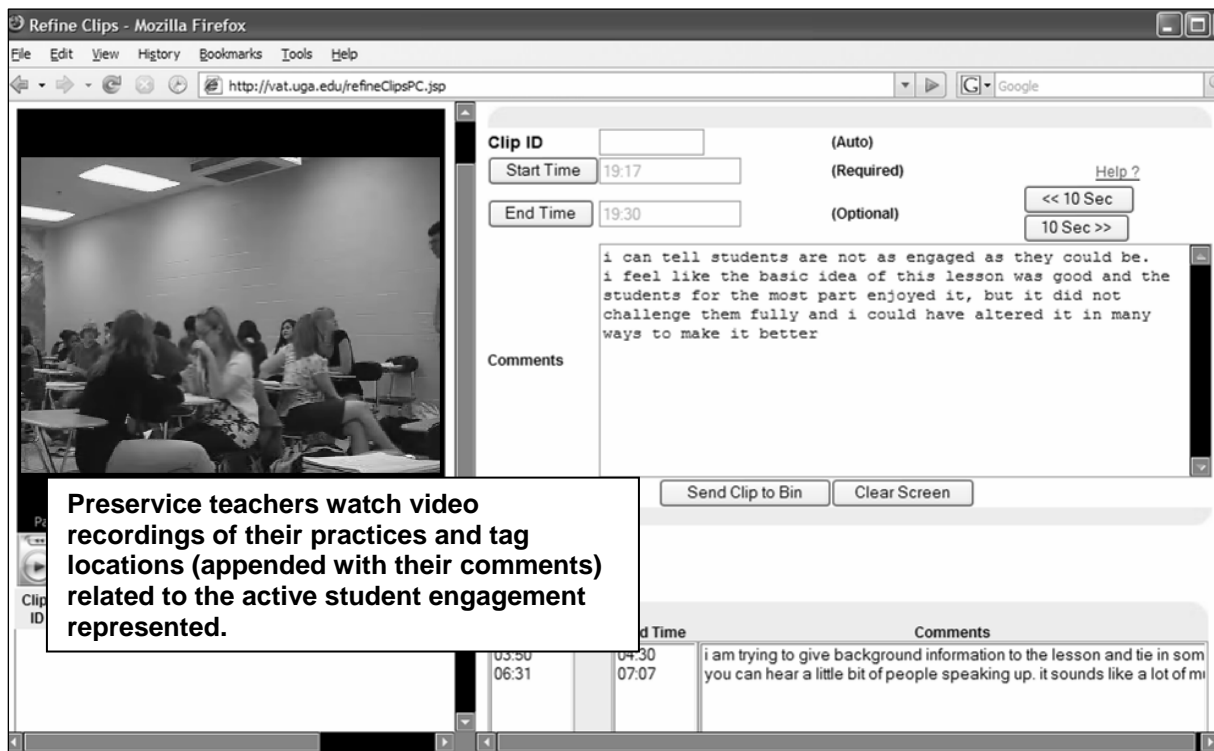Figure 3.1: Inquiry cycles and capture methods

Figure 3.2: Creating and tagging video segments in VAT

Traditional eportfolio

- Introduction
- Social Studies Education Rationale
- Current Resume
- Content and Curriculum
- Knowledge of Students and their Learning
- Learning Environments
- Assessment
- Planning and Instruction
- Professionalism

Inquiry cycles

- Inquiry Phase 1
- Inquiry Phase 2
- Inquiry Phase 3 ▶
- Tutorials

Inquiry Phase 3 edit page

Action Plan edit

What is the focus of your inquiry project for the next three-week period?

Organizing class discussions around "essential questions." Also, after giving directions for complex group activities to the whole class, check for understanding by asking students to explain directions back to you before breaking them into groups.

How might this method or technique influence active student engagement in your classroom?

By using "essential questions," students will learn why what they study matters as well as help them conceptualize the lesson. Similarly, by verbally checking for understanding after giving students directions, I will be able to know in real time, if students are listening.

In one or two paragraphs please describe what you will do over the next three weeks to enact and improve your teaching in relation to the focus mentioned above.

We will be working on numerous projects and I will utilize these measures of active student engagement to help students realize the importance of the content material. I will try my best to focus lessons around essential questions rather than unit questions in order to truly engage students in higher order thinking. I have been and I will continue to work beyond textbook materials and help relate content knowledge to students' lives. Through active student engagement I will work to meet students' needs in a way that will increase their awareness of the world around them and its application to economics.

Evidence Collection Plan edit

What method of promoting active student engagement are you focusing on?

I am focusing on class discussions around essential questions as opposed to unit questions as well as giving complex directions to groups and checking for understanding.

Describe how this method might promote active student engagement?

I think that this method might promote active student engagement because essential questions will help students to think out of the box and understand that every question does not necessarily have one definite answer. This will help students to develop the capacity for thinking out of the box and towards active learning. I think that checking for understanding when giving instructions for activities will help keep all students on the same pace. Checking for understanding allows me as the educator to completely know if students understand what tasks they have in front of them. Similarly, students will thus become more actively engaged instead of actively confused of what is expected of them.

How is this method different from what you are currently doing?

Figure 3.3: Reflection questions and responses regarding method selection in LiveText

CHAPTER 4

BEYOND RECOLLECTION: RE-EXAMINING PRESERVICE TEACHER PRACTICES USING

STRUCTURED EVIDENCE, ANALYSIS, AND REFLECTION[4]

Background

Since the mid 1980s preservice teachers have used professional portfolios to document competency, promote alternative and self assessments (Bird, 1990; Loughran & Corrigan, 1995; Reis & Villaume, 2002), heighten awareness of professional standards (Willis & Davies, 2002), inquire into current practices (Zembal-Saul, Haefner, Avraamidou, Severs, & Dana, 2002), gain technological, content, and pedagogical skills (Land & Zembal-Saul, 2003; Wilson, Wright, & Stallworth, 2003), and facilitate professional development (Grant & Huebner, 1998; Green & Smyser, 1995). Though varied in purpose, structure, organization, and format (Bullock & Hawk, 2001; Zeichner & Wray, 2001), many researchers specify reflective practices as the primary benefit of portfolios (Borko, Michalec, Timmons, & Siddle, 1997; Reis & Villaume, 2002; Wade & Yarbrough, 1996).

Surveying 24 teacher education programs, Anderson and DeMeulle (1998) found that most programs adopted portfolios to document preservice teacher growth and to promote reflection, self-assessment, and accountability. Borko et al., (1997) found that preservice teachers who collected and examined portfolio artifacts stated that the process helped them to reflect on their work and prepare them for future employment. In a survey of 212 preservice teachers followed by open-ended interviews, Wade and Yarbrough (1996) found that 63% of participants indicated that portfolios helped them to reflect and find out about themselves. Indeed, Bullock & Hawk (2001, p. 13) stated that "without written reflection, a portfolio is just a scrapbook."

According to Schön (1987), individuals practice two forms of reflection, reflection-in-action and reflection-on-action. The former involves near instantaneous decision making to better current situations. Because decisions are made rapidly, reflection-in-action distinguishes experienced professionals from novices. By contrast, reflection-on-action describes intense scrutiny of practice at some point following the event. Given the limited experiences of preservice teachers, portfolio proponents indicate that the purposeful collection and examination of teaching artifacts (e.g., lesson plans, student work samples, video recordings, teacher observations, etc.) helps them to reflect-on-action and facilitates professional growth (Barton & Collins, 1993; Conderman, 2003; Wolf, Whinery, & Hagerty, 1995). Richert (1990)

stated that the collection and organization of artifacts helped preservice teachers to reconstruct classroom practices that could not be examined in the moment because of teaching demands. According to Richert, collecting and examining artifacts helped preservice teachers to critically examine their craft and make adjustments as needed. Avraamidou and Zembal-Saul (2002), reached similar conclusions. They found that portfolios helped two preservice science teachers to examine and refine teaching claims based on supporting evidence. At the beginning of the study, preservice teachers wrote teaching philosophies and indicated three beliefs about teaching science. They then examined those beliefs by collecting and examining portfolio evidence. Through this process, preservice teachers included increased evidence backing claims, increased connections between field experiences and course work, more specific claims about student learning, and increased explanatory (rather than descriptive) writing.

To facilitate and support reflective practices within portfolio development, some researchers have turned to question prompts and scaffolds (Borko et al., 1997; Land & Zembal-Saul, 2003; Shepherd & Hannafin, 2007). These scaffolds are believed to help preservice teachers focus on specific aspects of their practice as they examine collected artifacts and inquire into appropriate methods. Whipp (2003), for example, found that when discussion prompts, clearly defined grading criteria, and timely feedback were added to reflective assignments, 17 preservice teachers engaged in higher levels of reflection than did 34 preservice teachers without these supports. Other researchers indicated the need for coaches or mentors to support portfolio practices (Carroll, Potthoff, & Huber, 1996; Fallon & Watts, 2001; Zembal-Saul et al., 2002) and implement activities that promote preservice teacher ownership through personal expression and portfolio inclusion in addition to programmatic purposes and requirements (Borko et al., 1997; Carroll, et al., 1996; Wade & Yarbrough, 1996).

Yet several limitations regarding portfolio development and reflective practices have been reported. Although researchers cite reflective practices as a benefit of portfolio development, they often rely on anecdotal accounts and preservice teacher perceptions rather than on evidence (Delandshere & Arens, 2003; Wade & Yarbrough, 1996). In a review of portfolio literature, for example, Zeichner & Wray (2001) stated that most researchers failed to include sufficient information about portfolio practices

69

so that others could scrutinize claims and assess the quality of preservice teacher reflections. Although researchers indicated reflective gains, they did not provide enough data to validate their claims.

Delandshere and Arens (2003) made similar conclusions following a review of portfolio practices among three teacher education programs. Although preservice teachers included artifacts and reflections to demonstrate mastery of professional standards, they rarely provided sufficient explanation to warrant claims. Indeed, limitations in artifact reflections led portfolio assessors to rely on their own opinions when grading preservice teacher practices. Given these limitations, some researchers claim that novice teachers lack sufficient experience to attend to and examine teaching practices without support from more experienced colleagues and systems (e.g., Bryan & Recesso, 2006; Rippon & Martin, 2005).

Even when portfolios employ embedded scaffolds and supports, researchers have identified limitations. Although Land and Zembal-Saul (2003) embedded questions to help preservice science teachers inquire into principles of light, these prompts did not take replace the need for coaching and feedback. Reflecting on erroneous information obtained in previous activities, one group failed to develop content knowledge despite having reconstructed, examined, and compared previous and current activities through eportfolio artifacts and guided reflection prompts. Land and Zembal-Saul concluded that eportfolios only facilitated skills development when participants had sufficient background knowledge, were able to accurately self-assess, and received consistent and timely feedback from mentors.

Other researchers have questioned whether the cost, time, and resource requirements of portfolio development are justifiable (Delandshere & Arens, 2003; Delandshere & Petrosky, 2004). Fallon and Watts (2001), for example, found that preservice teachers spent between 6.5-10.5 hours per week on their portfolios over the course of their program. Time constraints also affect faculty and staff who act as coaches. Robinson (2005) reported that portfolio assessors for a state implemented program among beginning music teachers required 50 hours of training before they could begin reviewing portfolios.

Given the ambiguities of portfolio production and reflection, the purpose of this paper is to examine the extent to which structured eportfolios focused on formative assessment affect reflective practices among preservice teachers. We examined how the purposeful and structured collection and

70

examination of artifacts influences preservice teachers' abilities to identify evidence of active student engagement in their classrooms and how artifact analysis influences eportfolio conclusions about teaching practices.

<div align="center">Methods</div>

Setting

As a capstone project for the Secondary Social Studies Teacher Education Program at a large university in the southeastern United States, preservice teachers complete an electronic portfolio by the conclusion of a seminar taken concurrently with a 12-week field experience. Eportfolios are designed to display both current perceptions towards social studies teaching and to highlight programmatic milestones as a culmination of preservice teachers' course and field work. Each eportfolio is aligned to the National Council for the Social Studies (NCSS) standards and the Georgia Systemic Teacher Education Program (GSTEP) standards. Within each eportfolio, preservice teachers include a rationale paper that describes current beliefs about teaching social studies and indicates how those beliefs relate to their professional practices. They also include at least one artifact and reflection paper for each of the six GSTEP domains. Course instructors pay particular attention to synthesis papers because they identify how preservice teachers juxtapose classroom practices, personal rationales, and professional standards to examine their craft. At the conclusion of the program, prospective graduates present and defend their eportfolios before faculty members and peers.

Throughout five years of eportfolio implementation, several problems have been observed. Although production was intended to span multiple semesters, many preservice teachers constructed eportfolios during the final three weeks of their program—following field experiences and methods courses (Shepherd & Hannafin, 2007). Additionally, while preservice teachers included one artifact per GSTEP domain, assessors placed little emphasis on them because they considered the domains too broad to represent with 1-2 artifacts. Some faculty members questioned the need of artifacts beyond reflection papers, stating that they were little more than a checkpoint on the evaluation.

During Fall 2006, the eportfolio assignment was expanded to include three formative inquiry cycles based on Evidential Reasoning and Decision Making (ERDM) methods (Recesso et al., in press). Based on a legal model where the relevance, proximity, credibility, and immediacy to the phenomenon of interest affect the force of evidence (Anderson, Shum, & Twining, 2005; Shum, 1994), ERDM guides practitioners and administrators to focus on a specific aspect of practice, and to systematically identify, gather, interpret, and act upon evidence related to that practice (Recesso et al., in press). Participating preservice teachers used ERDM methods to document and examine active student engagement (a focus of the social studies program) during their 12-week field experience. Given concerns over faculty and field instructor buy-in during the previous semester (see Chapter 3), inquiry requirements were carefully documented and explained to all field instructors and supporting faculty, included within course syllabi, and presented to preservice teachers prior to during an introduction to student teaching the previous semester. Tutorials, inquiry ideas, potential evidence, and question prompts were also refined and placed within eportfolio templates to facilitate inquiry processes. Modified eportfolio assignments were also incorporated in all seminar sections.

Participants

This study focused on undergraduate preservice teachers enrolled in a single section of the student teaching seminar. Using purposive sampling (Patton, 2002), we initially identified nine preservice teachers to participate based on preliminary course instructor feedback on the first inquiry cycle, and feedback from seminar assignments and researcher field notes on participation to that point in the seminar. Based on these initial assessments, preservice teachers were classified as high, medium, or low enactors. High enactors excelled in early seminar coursework, related program goals to field experiences, and went beyond basic inquiry requirements by implementing techniques multiple times and documenting implementations with several, relevant artifacts. Medium enactors tied program goals to field experiences and completed inquiry and course requirements, but it was unclear whether they implemented their techniques more than once or represented their efforts with artifacts. Low enactors did not connect program goals and field experiences and struggled with the course and inquiry assignments, often turning

in late work or omitting required inquiry sections and artifacts. Seven individuals decided to participate; one was subsequently removed from the study for failure to complete major inquiry cycle sections.

All participants were Caucasian preservice teachers in their early twenties. During the study, four completed field experiences at local high schools (two within the same high school) and two at middle schools. Kim[5] and Luan represented high enactors: Kim taught U.S. History and Luan taught state history in middle school. Among the medium enactors, Dale taught psychology and Kristen taught Advanced Placement Microeconomics. Ben and Kyle represented low enactors; Ben taught world history and Kyle taught middle school geography.

Tools

LiveText. The social studies program used LiveText™ to create and store individual student eportfolios. As depicted in Figure 4.1, this Internet-based tool (http://www.livetext.com) allowed preservice teachers to create consistent eportfolio layouts using template-based shells. Question prompts placed within inquiry sections scaffolded reflective practices. All artifacts and reflection papers (with the exception of video evidence included in the present study) were housed within LiveText eportfolios. Preservice teachers were given LiveText accounts in previous methods courses and shared eportfolios with seminar faculty, researchers, and field instructors for feedback and review.

Video Analysis Tool (VAT). The Video Analysis Tool is a secure, Internet-based application (http://vat.uga.edu) for capturing, storing, and analyzing streaming video files. Participants recorded episodes of their student teaching, converted and uploaded them to VAT, chunked their recordings into relevant segments, analyzed those segments using included frameworks or rubrics, and wrote comments about the relationship of video segments to their eportfolio focus and additional artifacts (see Figure 4.2). Participants also shared their video analyses with the course and field instructors for feedback and assessment.

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[5] Pseudonyms have been used throughout this paper

Procedure

At the beginning of the semester, each preservice teacher created an eportfolio using the LiveText template designed by the researchers and seminar instructor. In addition to traditional eportfolio components, the template included three inquiry cycles based on ERDM methods and focusing on formative development (see Figure 4.1). Additional supporting documents described inquiry cycles (Appendix G), provided a brief explanation of active student engagement, and listed techniques believed to influence active student engagement in the classroom (Appendix H). For each inquiry cycle, preservice teachers were asked to select and implement one technique during four weeks of their field experience. Prior to implementation, question prompts within inquiry cycles (Appendix I) asked preservice teachers to describe how they would implement the method, how implementation differed from their typical practices, what problems might arise, and how they would address those problems. Prompts also asked preservice teachers to identify two or more artifacts for inclusion, describe how they related to their technique, and indicate how they would depict active engagement in the classroom. Supporting documentation within eportfolio templates suggested artifacts for inquiry cycles (Appendix J).

During the four-week period, preservice teachers implemented their technique, wrote initial reactions regarding its effectiveness in inquiry sections of their eportfolio, and collected artifacts. They also videotaped at least one implementation for inclusion. Video recordings were examined within VAT (See Figure 4.2) using an included rubric derived from the GSTEP standards (Appendices K and L). Individuals uploaded videos, tagged instances of active engagement, indicated what the tag represented and the degree to which these sections aligned with select GSTEP indicators. The course instructor also examined the video segments and marked their alignment with GSTEP indicators.

In addition to VAT analyses, embedded questions asked preservice teachers how their artifacts strengthened or altered their initial perceptions of the activity and influenced active engagement. They were also asked to offer explanations that might account for observed outcomes. Finally, preservice teachers wrote their overall perceptions of success, identified what they could do in the future (based on artifact examinations) to improve their practice, and indicated whether they would focus on these plans

during their next inquiry cycle or select a different focus from the list. This process was repeated for the

three inquiry cycles completed during the 12-week field experience.

Data Sources and Analysis

Data sources included weekly field notes taken during each seminar class, inquiry cycles (with

reflections and artifacts), semi-structured interviews conducted at the end of each inquiry cycle

(Appendices M and N), instructor feedback provided after the first two inquiry cycles, and two semi-

structured instructor interviews conducted after the second inquiry cycle and following course completion

(Appendices O and P). All interviews focused on identifying perceptions towards formative eportfolio

development within inquiry cycles, rationale for artifact inclusion and analyses, steps taken for cycle

completion, and supports received. All interviews were audio recorded and transcribed verbatim.

Using case-based methods (Yin, 2002), open-coding, and constant comparison (Glaser & Strauss,

1967; Pigeon & Henwood, 2004; Strauss & Corbin, 1990), analysis began immediately following

eportfolio training and continued throughout the study. Through open-coding and constant comparison,

several categories, concepts, and properties were identified, defined, and refined. All data, memos, and

hypotheses were collected in Atlas.Ti 5.2. Data obtained through inquiry cycle entries were triangulated

with participant and instructor interviews, written feedback, and field notes (Patton, 2002).

In addition to triangulation, a representative sample of data and codes were provided to five

external, qualitative researchers to examine researcher bias (Appendix F). These researchers were first

introduced to the codebook, code definitions, and examples of each code. Next, they individually applied

these codes to six excerpts from the data. When coding differed between external reviewers, researchers,

or both, refined our coding scheme until 100% agreement was reached. Following training, reviewers

received a Microsoft Excel spreadsheet with several excerpts representing each code. They coded these

examples individually using the consensus code book. We then compared inter-rater reliability, which

resulted in 91% agreement between our coding schemes and those of external reviewers. From this

analysis, we clarified definitions related to participant indicators of active student engagement and their

effects characterizations of engagement within classroom practices (Appendix Q).

Findings and Interpretations

Following artifact analysis, participants extended their characterizations of active student engagement beyond those made both prior to and immediately after implementing their techniques. Artifact analyses also influenced participants' perceptions regarding teaching success and influenced the development of individual improvement plans. Despite helping participants to refine opinions and to develop improvements for future implementation, however, few participants focused on those improvements during subsequent inquiry cycles.

Recognizing Engagement

During his first interview, Dale stated "A lot of the ideas that we're going through with our rationales and inquiry project haven't been as explicitly stated as in the [standards] but they have been stated in our methods and curriculum and intro classes and in the other education classes that we've had. So, we've engaged in [these] discussions before." Similar comments were made by other participants as evident during interviews and within field notes. When asked how to improve seminar discussions, Kristen stated "What we're doing is valuable but we're tired of talking about active student engagement. The topic is old." Active student engagement was a core principle of the social studies education program. However, according to instructors, preservice teachers entered the seminar with naïve and unclear expectations about active engagement in classroom settings. During the first inquiry cycle, both high enactors and one low enactor made 13 statements (Luan = 7, Kyle = 4, Kim = 3) in field notes, reflections, and interviews indicating uncertainties in gauging active engagement in their classroom. During her first interview, Luan mentioned "it's really hard for me to look at a person and [say] they're activity involved because they don't have to be talking or anything like that to be actively engaged." Kyle stated,

> if [a] person is staring at the ceiling because they are pondering a big question or…thinking about
> the material then they are engaged…If they're staring at the ceiling [and] thinking about what's
> for lunch then no. That's one of the things that makes [active engagement] so hard, [it's] not

necessarily participating in a discussion, it's thinking about it and really questioning it, analyzing it.

Despite expressed uncertainties, the systemic collection and analysis of inquiry artifacts helped all participants to broaden identifiers of active engagement. We anticipated that participants would become increasingly capable of identifying evidence of student engagement following opportunities to examine evidence. As Figure 4.3 summarizes, the indicators of active student engagement rose between initial estimates in field notes and responses to inquiry questions prior to implementation and artifact analyses in 78% of the inquiry cycles. Similar trends were observed between initial reactions following implementation and reflections following artifact analyses. In all but Kyle's first inquiry cycle, participants identified a greater number of indicators following artifact analyses than they had identified during their initial reflections. Additionally, generation of unique identifiers increased among all participants between initial reflections and artifact analyses (see Figure 4.4). All participants broadened characterizations of active student engagement between initial reflections following technique implementations and those conducted following artifact analyses. Participants became increasingly effective in identifying instances of engagement (or lack thereof) and ways of embodying engagement via inquiry-related artifacts. Identifying and discussing active student engagement in inquiry and seminar settings also helped to reduce participants' uncertainties. At the conclusion of their second eportfolio cycles, only Ben and Luan expressed uncertainty in assessing active engagement. Following the third inquiry cycle, only Luan expressed uncertainty in identifying active student engagement in her classroom.

Reassessing Practice

Evidence-based, systematic analysis of artifacts also helped many participants to reassess classroom practices. Although reflections and interviews indicated that conclusions mirrored initial reactions during at least one inquiry cycle, all participants modified conclusions one or more times following artifact analysis. When conclusions were similar to initial perceptions, artifact analysis strengthened claims and focused judgments. During Kim's second cycle, she decided to enact a civil war press conference simulation from a History Alive lesson to stimulate active engagement.

77

> This lesson…did not generate as much participation or interest as the past activities have…A few of the "actors" had no idea what the perspective of their person was about. They were unable to answer any questions posed by students…Some students did not even participate in the press conference.

Artifact analysis strengthened Kim's claim. Although students completed biographical sketches on their historical figure and generated questions for use during a mock press conference, they struggled to answer similar questions or remain in character during the video-recorded activity. Kim noted in her video that students who routinely participated in class struggled to participate during this activity, leading her to question whether they were adequately prepared for the simulation. Although Kim's conclusions mirrored her initial reactions, artifact examination helped to bolster claims and identify insufficient background knowledge as limiting student active engagement.

Artifact analyses within inquiry cycles also altered several participants' perceptions of success. In three cycles, Dale, Kristen, and Luan (medium and high enactors) stated that artifact analyses increased their perceptions of success. During Kristen's first inquiry cycle, she focused on using question prompts where students wrote their answers to introduce lesson contents. Initially she wrote "Overall, I feel like the [activity] was not as engaging as I had hoped it would be…I think [teachers] use the activities in many of their other classes, so [students] are used to 'doing' school in this manner."

After examining student work samples she wrote,

> Reviewing the [questions], I noticed that some were not very challenging and were similar to giving students 'busy work'…I was hoping for more of a drastic difference in focus and attention. This is not the students fault though because I think [my technique] has worked quite well when I…gave them interesting and challenging questions.

During seven cycles, systematic artifact analysis helped all participants to identify problems that had previously gone unnoticed. During his final inquiry cycle, Dale implemented a technique where students wrote responses to a topic on the chalkboard and linked them to others' comments. Following the activity, he wrote "once [students] got started, engagement was contagious. They were taking into

account what each other was saying and…became excited…I felt that I had some of the most active engagement I'd had the whole time student teaching." Upon reviewing his video and comparing it to individual responses, Dale tempered his conclusions:

> I still feel that engagement…was strong and [that] students who were engaged were more
> engaged than [they were] previously…I did, however, see that…some students wrote the bare
> minimum to be given credit and then stopped paying attention [while] the students who were very
> engaged overtook the discussion.

During the final interview, Dale stated that he "had probably 85 to 89% of [his] students involved in the activity." Although he concluded that his technique was successful, artifact analysis helped Dale to re-examine which students wrote comments, how many each made, and their quality, leading him to identify non-participants and adjust his assessment of success. Whether strengthening or modifying initial findings, the systematic collection and examination of inquiry cycle artifacts helped participants to recreate classroom experiences, identify engaged and non-engaged students, and support their conclusions with evidence.

Refining Practice

Inquiry cycles also helped preservice teachers to identify practices in need of refinement. At the conclusion of each cycle, participants documented how they could subsequently improve their practice. However, interviews and inquiry artifacts indicated they either did not provide improvement plans (or ignored artifacts when making recommendations), identified improvements consistent with initial reactions, or identified refinements suggested by artifacts.

Kim, Dale, and Kyle failed to include improvement plans or did not consider artifacts when constructing plans in several inquiry cycles. During Kim's first cycle, for example, she promoted active engagement by "asking students to discuss the relevance of whatever they [were] studying to their personal lives." At the conclusion she wrote "I am going to keep thinking of ways to connect student's lives with the material that they are learning…Other content throughout the year will lend itself to this technique better." Although noting that viewing video artifacts led her to identify less student engagement

79

than previously assumed, she resolved to continue use with more relevant topics rather than to make specific improvements.

Similarly, Kyle provided improvement plans during his first cycle but either ignored analysis findings or failed to support his claims. At the conclusion he wrote, "I need to ask effective questions…centered around a topic that is both educational and entertaining…so [students] will want to include themselves in the discussion." Although artifact examination helped Kyle and his seminar instructor to identify off-task behavior and the need to focus on discussion topics to help students respond, Kyle decided to focus on asking "meaningful questions" during his second cycle. While including such questions in his conclusions, neither his inquiry artifacts and reflections nor interview responses identified this need.

Additionally, recommendations for improvement mirrored initial perceptions in at least one inquiry cycle for all participants but Luan. During Kristen's second cycle, students researched poverty in the local community and presented suggestions to decrease it. Kristen stated in both her initial reactions and conclusions that the activity was successful, but indicated that a discussion comparing community suggestions would have been beneficial. Similarly, Ben initially wrote, "Students viewed this exercise as a 'free day' and chose not to participate in the discussion once the 'group leader' had firmly took hold of their group…I saw little communication…and few members spoke out." During video analysis, Ben concluded that students did not participate because he needed to "structure [his] debates (and other activities) more…so that several students [could] contribute—possibly creating a round based system in which each group member would be responsible for a [series of questions]."

However, the remaining participants' inquiry cycles included plans that directly coincided with artifact examinations. During her first inquiry, Luan divided her class into groups to explore the three branches of government. Within her initial reactions, she wrote,

> It is difficult to judge whether or not students are actively engaged when working in groups…I often found myself trying to decide whether or not students were on-task. Students appeared on-task, working on assignments, but…may have been discussing the up-coming Valentine's Dance.

Artifacts helped to identify when students were (and were not) engaged. For example, Luan's VAT comments indicated that groups were often off-task. In one instance she noted "instead of working together, most group members are working independently, or not working at all." In her first interview, Luan speculated "one person would typically do [the work] and everyone else would end up copying." However, when student work samples indicated that group work facilitated collaboration and engagement, Luan observed that "One center worked really well…because [students] had to work together to produce one end product (whereas in the other two centers they were working as groups but were all doing individual sheets)." By increasing the difficulty of the assignment and focusing on a single, group-owned product, Luan noted that students were forced to participate, and that she would "scrap group assignments which can be accomplished individually," instead creating assignments that "force students to work cooperatively, producing one assignment."

During his third cycle, Ben facilitated a debate about alternatives to the cold war. Initially he wrote "there was a lot of dead time…between activities" and that he needed to better structure his debates. When analyzing his video in VAT he again identified "dead time" but noted that he "did not: A) keep the discussion on task with guided questions, B) prepare students for a discussion, [and] C) chose too broad of a topic." During his final interview, he mentioned that analyzing his artifacts helped him to realize that he needed to "to come up with questions…to ask if [the discussion] just stops." Although Ben's improvement plan mirrored comments made in his initial reactions, artifact examination helped him shift his focus away from "down time" toward narrowing topics, improving question prompts, and clarifying instructions.

Continuing Analysis

Interestingly, while several participants' improvement plans were based on inquiry artifacts, only low enactors (Ben and Kyle) applied these plans during subsequent cycles. During his first and third cycles, Ben focused on structuring debates to increase student participation and engagement. At the conclusion of his first cycle, Ben wrote that his technique was only partially successful and that he needed additional structure to facilitate participation. Ben revisited this technique during his third inquiry cycle.

81

Unlike his first attempt, he structured the assignment by having students individually ponder alternatives to the cold war, pair with others to discuss and refine ideas, and then debate them with the class. Likewise, Kyle focused on the same (or derivative) technique. During his first cycle, he called on individual students to increase participation and engagement. At the conclusion of this method he wrote that he needed to ask effective questions. Posing effective questions became the focus of Kyle's remaining two cycles.

Although other participants stated within interviews and field notes that they continued to implement their techniques, each selected new techniques during subsequent cycles regardless of their perceived success. For example, when asked whether he would continue to examine student-led presentations at the conclusion of his second cycle, Dale wrote "I feel that I can make some improvements on the strategy; I tried, and will do so when I use it again. But, I also feel that trying a new strategy will benefit me greater." Kristen made similar comments during her first interview when asked if she continued using warm-up writing activities to introduce lessons: "I do on occasion, when I have a good one…I'm still trying to figure out [warm-up activities] that help; most days I [am] just interested in perfecting the whole idea of warm up activities and seeing if it's possible." While dissatisfied with their implementations, both participants examined different techniques during subsequent inquiry cycles. All participants characterized their 12-week field experience as a time to explore lesson implementations in a sheltered, supportive environment. Kim summarized these reasons during her second interview.

> Student teaching is a time for me to try out as many techniques as possible…Even though I wasn't necessarily satisfied with the first or…second [cycles], I want to try out other ones to see if [they] work better. This is my chance to try out all these different methods…This inquiry project makes them more of a concentrated look into that specific method so I want to look at as many as possible.

Discussion and Implications

Because participants reflected on the success of their implementations both prior to and following artifact analysis, we compared the degree to which evidential reasoning methods influenced conclusions

82

about teaching experiences and active student engagement. Although they described indicators of engagement following lesson implementation and drew preliminary conclusions, their descriptions were strengthened and elaborated following artifact analysis. In all but one inquiry cycle, the systematic examination of classroom practices helped participants to broaden characterizations of active student engagement and connect theory and practice within teaching experiences. Although active student engagement was a pervasive program focus, systematic inquiry helped participants to observe and assess it in classroom episodes. Participants moved beyond mere description of classroom practices, concentrating instead on decision-making about student engagement through the recreation and examination of purposefully selected artifacts.

Similar to claims by Borko et al., (1997), prompts embedded within inquiry portions of eportfolio templates helped preservice teachers to apply evidence-based methods and to warrant their decisions with supporting evidence. Prior to implementation, preservice teachers identified artifacts to help them detect active engagement among their students and explain how these artifacts would manifest engagement. This practice helped them to focus and attend to relevant phenomena during both implementation and analysis. Prompts, in combination with collected artifacts, helped participants to either bolster or modify initial claims based on careful classroom reconstructions. Reconstructions also helped them to examine their teaching from different points-of-view and, in several instances, identify areas for future improvement.

In addition to eportfolio scaffolding and development, student teachers received supports that likely influenced their recognition and characterization of active student engagement. Participants often discussed active engagement within seminar discussions and spoke with field supervisors and cooperating teachers regarding classroom activities. Field instructors and peers also examined a total of five classroom implementations during which active engagement was discussed. Thus, it is unclear the extent to which eportfolio and/or ongoing program and inquiry activities influenced participant notions of active student engagement. However, consistent increases in the recognition and characterization of active student engagement following lesson enactments and during evidence examinations provided clear evidence of improvement.

Inquiry cycle implementations also exhibited limitations in evidential reasoning. One participant was excluded from the study because he failed to fully implement evidential reasoning methods. Although question prompts, instructor feedback, and other supports helped participants to identify and indicate how artifacts related to chosen techniques, it was unclear how some artifacts influenced analyses. Consistent with Delandshere and Arens' findings (2003), preservice teacher details for artifact inclusion were often insufficient. Even when reminded to include detailed descriptions within their inquiries during and at the conclusion of each cycle, the use of artifacts (other than video) for analysis purposes often could only be clarified via direct questions specifically on how evidence supported decisions. Although evidence-based methods helped participants to collect and analyze artifacts related to specific techniques, these methods may require additional scaffolding. Consistent with anecdotal recommendations by Wolf et al. (1995), eportfolio developers may need regular discussions with mentors to fully describe teaching artifacts, their rationales for inclusion, and any approaches they took for analyses.

Similarly, Land and Zembal-Saul (2003) noted that embedded questions helped most participants to increase their knowledge about properties of light, yet hindered others who relied on inaccurate artifacts. While Land and Zembal-Saul concluded that consistent and timely feedback coupled with sufficient content knowledge and question prompts could alleviate this problem, this was not evident in our study. Rather, participants originally selected as low enactors continued to include irrelevant artifacts despite timely and consistent feedback while others included relevant artifacts and drew conclusions consistent with those of the course instructors. Thus, while eportfolio development can facilitate self-examination and provide useful results to inexperienced teachers, reflective prompts, technique and artifact inclusion ideas, embedded tutorials, consistent coaching, and timely feedback may not guarantee improvement.

It is possible that lack of supporting evidence also stemmed from insufficient buy-in to eportfolio practices. As stated, two participants were initially selected because of minimal participation in inquiry processes and a third was removed from the study for lack of participation. Additionally, some support personnel and faculty members questioned the inquiry project, and may have conveyed negative views to

84

participants. However, though not required, three participants exhibited extensive buy-in. Luan, Kim, and Kristen collected and analyzed several pieces of evidence to inform their decisions, and implemented inquiry techniques several times during each cycle. Additionally, they stated that inquiry cycles helped them to focus on technique implementations and their effects on active engagement; thus, they wanted to implement as many as possible while student teaching.

Several researchers indicate the need for portfolio coaching among preservice teachers and faculty (e.g., Borko et al., 1997; Carroll et al., 1996; Conderman, 2003; Wolf et al., 1995). However, research is needed to identify the types of coaching that facilitate evidential reasoning and the degree to which coaching can be embedded within technological tools. Specifically, what procedures should coaches target to improve preservice teacher practices? How, when, and in what direction should feedback be provided? How might preservice teachers' inexperience with self-examination and classroom instruction affect coaching decisions and outcomes?

In an effort to increase personal meaning, voice, and buy-in among preservice teachers (e.g., Borko et al., 1997; Reis & Villaume, 2002; Wade & Yarbrough, 1996), we did not mandate that participants focus on previous techniques during subsequent eportfolio cycles—implementing improvement plans. However, to encourage refinements, we reduced artifact requirements for those who attempted to refine specific practices across multiple cycles by using previous evidence as baseline data for subsequent cycles. Still, only two participants examined similar techniques across multiple cycles. The remaining participants indicated that they explored new techniques during subsequent inquiry cycles because they wanted to take full advantage of their field experiences. Thus, it is unclear whether sustained analyses of specific teaching practices might influence preservice teachers' application of evidence-based methods over time.

For evidence-based, formative assessment eportfolios to both document and support professional growth, several issues must be addressed. Longitudinal study of specific teaching practices is needed to examine the potential tradeoffs and interplay between the refinement of teaching skill and eportfolio requirements. Such research is critical given the well-documented lack of portfolio use beyond graduation

during induction through inservice (Grant & Huebner, 1998; Rolheiser & Schwartz, 2001; Shepherd &

Hannafin, 2007). Research is also needed to examine the interplay of evidence-based methods and teacher

voice, buy-in and perceptions of eportfolio ownership. Do teachers perceive eportfolios based on

evidential reasoning more as external requirements or vehicles for professional improvement? Finally, as

preservice transition to professional teaching communities, we need to better understand how (or if)

evidence-based eportfolio methods accommodate diverse institutional requirements and expectations.

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Figure 4.1: Reflective prompts within LiveText inquiry cycles

Figure 4.2: The Video Analysis Tool

			Hypothesis	Initial	Analysis	Hypothesis	Initial	Analysis	Hypothesis	Initial	Analysis
				1st Cycle			2nd Cycle			3rd Cycle	
High		Kim	12	6	19	15	4	10	19	12	18
		Luan	10	4	18	5	7	21	14	4	20
Med		Kristen	13	4	14	9	8	15	12	4	14
		Dale	6	3	5	11	4	11	6	6	18
Low		Kyle	9	9	7	9	7	12	11	5	16
		Ben	8	6	15	7	2	8	11	4	16

Figure 4.3: Number of active student engagement identifiers across inquiry cycles

| | | 1st Cycle | | 2nd Cycle | | 3rd Cycle | |
		Initial	Analysis	Initial	Analysis	Initial	Analysis
High	Kim	1	7	1	2	0	3
High	Luan	1	7	4	15	0	7
Med	Kristen	0	4	2	6	0	4
Med	Dale	1	2	3	5	4	11
Low	Kyle	3	3	2	4	1	6
Low	Ben	4	6	1	4	1	5

Figure 4.4: Generation of unique student engagement identifiers within inquiry cycles

CHAPTER 5

SUPPORTING PRESERVICE TEACHER REASONING THROUGH ELECTRONIC PORTFOLIOS[6]

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[6] Shepherd, C. E., & Hannafin, M. J. Submitted to the *Journal of Technology and Teacher Education*, 4/18/2008

Background

Recent federal and state legislation has placed increased emphasis on professional teaching standards, teacher accountability, and student achievement (Cochran-Smith, 2005; Cochran-Smith & Fries, 2005; NCATE, 2006). These initiatives have led schools, districts and states scrambling to document teaching practice and improve teacher quality. Recent research stresses the importance of evidence, particularly measurable outcomes of student achievement to assess teacher quality (Cochran-Smith, 2005; NCATE, 2006). Several authorities contend that experimental studies based on random assignment provides "gold standard" evidence to develop and validate teacher practice (Lasley, Siedentop, Yinger, 2006; Whitehurst, 2002; Wineburg, 2006).

While such studies may influence policy decisions, thus far they have yielded little evidence related to teacher professional development. Rather, educators have pursued means to document standards-based practice and increase accountability within pre- and inservice settings. While some have advocated standardized testing to measure teacher content knowledge (Guyton & Farokhi, 1987; Zumwalt & Craig, 2005), several researchers suggest such tests fail to provide accurate representations of teacher practice and pedagogy (Bird, 1990; Gitomer, Latham, & Ziomek, 1999). Indeed, some researchers have examined alternatives to promote and document teacher effectiveness, include reflective journals, project-based learning, authentic and performance-based assessments, professional certifications, professional evaluations, and teaching portfolios aligned to professional standards (Caroll, Pothoff, & Huber, 1996; Delandshere & Petrosky, 2004; INTASC, 2005; Wolf, 1991). The use of portfolios to document and promote teacher development has generated particular interest in recent years.

Portfolios have been used for state licensure, induction, and mentoring experiences (Kelley, 2004; Robinson, 2005; Zepeda, 2002) as well as National Board Certification (NBPTS, 2007). Since their introduction among preservice teachers duri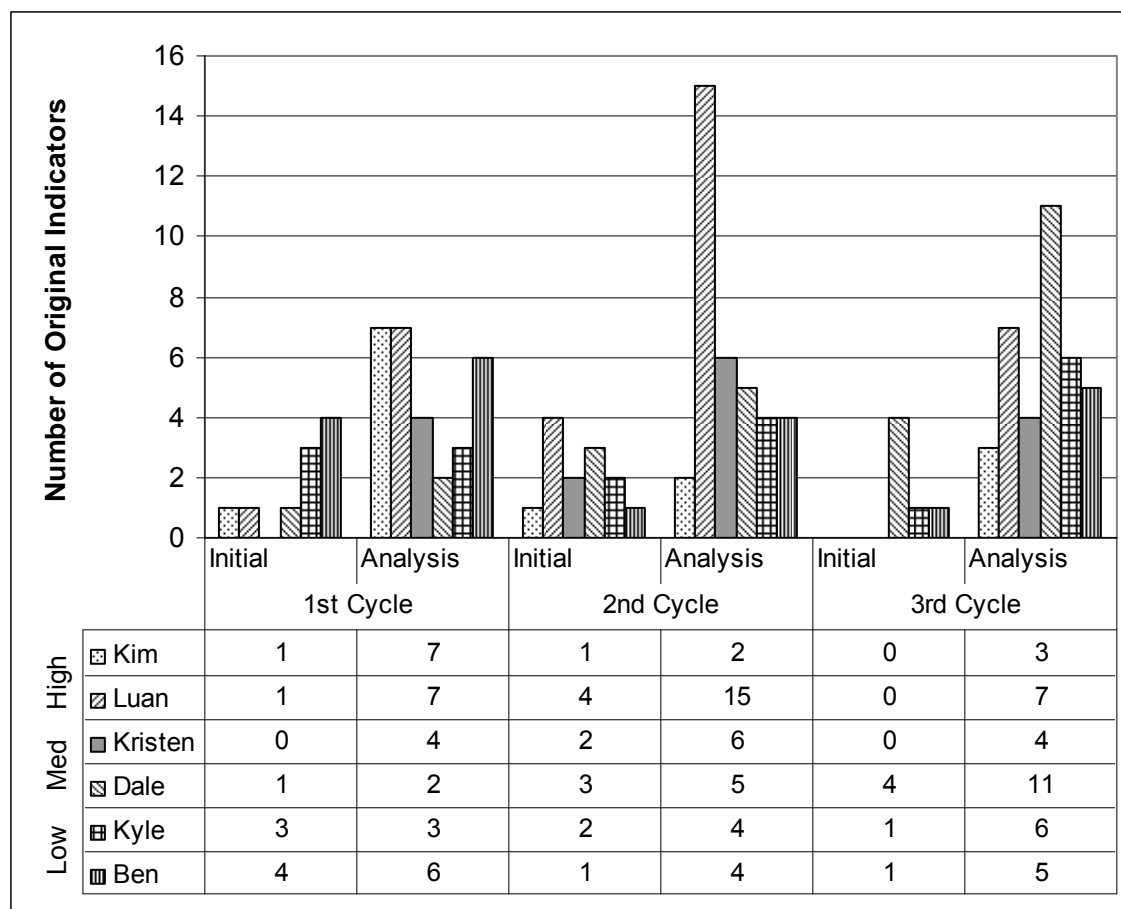ng the mid 1980s, portfolios have been used by teacher education programs to document and examine teaching practices (Barton & Collins, 1993; Carroll et al., 1996; Fallon & Watts, 2001). Green and Smyser (1995) found that preservice teachers who developed portfolios rated their importance for professional development, reflection, and sustained teacher

94

evaluation more favorably than those that did not. Proponents claim that portfolios facilitate personal reflection (Avraamidou & Zembal-Saul, 2003; Wade & Yarbrough, 1996), promote skills acquisition (Land & Zembal-Saul, 2003; Rolheiser & Schwartz, 2001), and to re-construct classroom practices (Borko, Michalec, Timmons, & Siddle, 1997; Richert, 1990).

Several researchers have suggested that portfolio benefits arise from the capture, organization, and reflection on classroom evidence (e.g., Johnson, Mims-Cox, & Doyle-Nichols, 2006; Richert, 1990). This evidence helps preservice teachers to re-create classroom experiences and identify facets that previously escaped their attention (Loughran & Corrigan, 1995; Richert, 1990). Similarly, Anderson, Shum, and Twining (2005) noted that purposefully selected and organized chains of evidence can interactively approximate classroom phenomena by capturing multiple facets of an event.

With the emergence of the Internet, the call for technology-driven assessment systems that document teacher candidate growth over time (NCATE, 2006), and ease of access, storage and dissemination of online data, many teacher education programs adopted electronic portfolios to promote and formatively document preservice teacher growth (Gatlin & Jacobs, 2002; Reis & Villaume, 2002). Land and Zembal-Saul (2003), for example, embedded question prompts within eportfolios to help preservice science teachers explore and develop content knowledge as they conducted experiments, record results within eportfolios, and utilize those collections in later inquiries. Similarly, Whipp (2003) reported that question prompts within eportfolios and reflective journals helped preservice teachers to reflect more deeply on their teaching practices.

Despite reported benefits, several limitations have been reported. Much of the published research emphasizes anecdotal evidence or perceptions (Wade & Yarbrough, 1996; Zeichner & Wray, 2001). Researchers suggest that extensive personal coaching may be required to support technology used during portfolio development, align individual goals with program and faculty objectives (Borko et al., 1997), analyze portfolio evidence (Bryan & Recesso, 2007), and provide feedback related to teacher inquiries (Carroll et al., 1996; Land & Zembal-Saul, 2003). Delandshere and Arens (2003) found that most preservice teacher's rationale for including evidence was insufficient. Bryan and Abell (1999) reported

that preservice teachers lacked sufficient experience and skill to identify most relevant practices when video recording student teaching experiences and analyzing them via Internet-based tools. These reports are consistent with still other researchers who noted that beginning teachers often lack inquiry skills necessary to focus on important classroom behaviors for purposes of change (Carver & Katz, 2004; Rippon & Martin, 2006).

The purpose of this paper is to examine the influence of supports embedded within electronic portfolios on the reasoning of preservice teachers. Specifically, we examined how eportfolio scaffolds influenced evidential reasoning among preservice teachers, the extent to which coaching was required to complete eportfolio tasks, and the supports used and/or perceived as valued by preservice teachers.

Methods

Setting

At a large southeastern U.S. university, eportfolios were adapted for four sections of a capstone social studies education seminar to include three formative inquiry cycles that focused on active student engagement (a program emphasis) during student teaching experiences. Preservice teachers completed this seminar concurrently with a 12-week field experience. Faculty members identified several problems with the previous eportfolio method, wherein students documented teaching philosophies, resumes, and reaction papers to each of six state teaching standards. Eportfolio activities were designed to document the individual's current perceptions towards social studies teaching and to highlight programmatic milestones within course and fieldwork. Although reaction papers included one or more artifacts representing preservice teacher mastery on the standard in question, it was unclear how they added to reflections within the eportfolio papers; thus, few faculty members examined them. Additionally, most preservice teachers waited until their field experiences concluded to begin eportfolio development, completing the entire task within the last three weeks of their program.

During Fall 2006, the eportfolio assignment was expanded to include three inquiry cycles based on principles of Evidential Reasoning and Decision Making (ERDM) methods (Recesso et al., in press). These changes were questioned by some social studies faculty and support personnel because they were

done with minimal discussion and not included in the course syllabus (see Chapter 3). To increase buy-in, among faculty and support personnel, additional measures were taken during Spring 2007. Among these, preservice teachers and support personnel were informed about the inquiry portion of the eportfolio prior to beginning student teaching and seminar, a detailed assignment description was provided along with technique and artifact recommendations, the assignment was included in the course syllabus with a separate grade-breakdown from the traditional eportfolio, and several tutorials and question prompts were refined for clarity.

Tools

LiveText. An eportfolio template for preservice teachers was created using LiveText, an Internet-based, password protected eportfolio system (http://www.livetext.com). As illustrated in Figure 5.1, this template housed the traditional eportfolio sections used in previous semesters and three sections that focused on inquiry and formative assessment using question prompts and professional standards (Appendices I, K, and L). Additionally, the template included inquiry directions (Appendix G), technology tutorials (Appendix R), and suggestions for potential inquiry foci and evidence (Appendices H and J). Preservice teachers logged into personal LiveText accounts, uploaded supporting evidence as attachments, and responded to supporting questions. After completing formative assessment sections, they shared their work with their seminar and field instructors and the research team for feedback and assessment.

Video Analysis Tool (VAT). The Video Analysis Tool is a secure, Internet-based application that allows users to upload and analyze streaming media files (http://vat.uga.edu). Once a video is uploaded to VAT, individuals tag particular segments, analyze segments using professional standards or rubrics, and embed comments to provide additional details about decisions made or rationales for inclusion (see Figure 5.2). Tagged video files can also be shared with external reviewers for feedback and assessment purposes.

Procedure

At the beginning of their field experiences, preservice teachers received classroom training about the eportfolio, LiveText, video recording, and VAT and created their eportfolios using a LiveText template that included three inquiry cycles. As shown in Figure 5.3, during each cycle preservice teachers selected a specific technique believed to promote active student engagement in their classrooms and planned how they would implement that technique. While planning, they responded to question prompts within inquiry cycles to compare their technique to current methods of instruction, identify potential sources of evidence that would depict engagement levels among students, and indicate how that evidence would inform them about the success of their implementations.

As shown in Figure 5.4, during the next four weeks, preservice teachers implemented their techniques and captured at least three pieces of evidence (including one video recording) to examine technique effectiveness. Immediately following their implementations, preservice teachers responded to questions in their eportfolios that asked them to reflect upon their success. Then they analyzed their evidence using VAT and additional question prompts placed within the inquiry cycles, drawing conclusions about the success of their technique in promoting active student engagement, hypothesizing and assessing alternative explanations, and developing improvement plans for subsequent implementations. Finally, preservice teachers decided to enact these plans within future inquiry cycles or to select new techniques.

Participants

Using field notes and instructor feedback, six, undergraduate participants were purposefully selected for this study (Patton, 2002) based on their inquiry participation during the first four weeks of seminar. Luan[7] and Kim, high enactors, were selected because they went beyond basic inquiry requirements, gathering several sources of evidence in addition to the requirements and implementing their techniques multiple times during the four-week cycle. Dale and Kristen represented average enactors selected because they completed all requirements. Ben and Kyle represented low enactors who, although

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[7] Pseudonyms have been used to maintain confidentiality

eventually completing all requirements, missed multiple deadlines and struggled with related seminar assignments.

Data Sources and Analysis

Data sources included demographic questionnaires taken at the beginning of the semester (Appendix S), inquiry cycles and VAT analyses, field notes taken during weekly seminar courses and during technical support sessions, and semi-structured interviews conducted with participants at the conclusion of each inquiry cycle (Appendices M and N) and with the instructor following the second inquiry cycle and at the semester's end (Appendices O and P) to triangulate findings (Appendix F). All interviews were transcribed verbatim. Using case-based methods (Yin, 2002), open-coding, and constant comparison (Glaser & Strauss, 1967; Pigeon & Henwood, 2004; Strauss & Corbin, 1990), analysis began after technology training sessions at the beginning of the semester and continued throughout the study. Using Atlas.Ti 5.2 and coding schemes described by (Lewins & Silver, 2007), we defined and refined concepts, categories, and definitions using data, memos, and hypothesis formation and testing (Appendix Q).

Findings

Question prompts (Appendix I), assignment directions (Appendix G), and support materials placed within eportfolios (Appendices H and J) helped preservice teachers to identify inquiry foci, collect and examine evidence of active student engagement, and construct improvement plans for further development. Embedded question prompts were helpful in supporting evidential reasoning and aligning preservice and course objectives within inquiry cycles. Despite embedded supports, personal communication and coaching was required for detailed rationales of evidence inclusion and analysis and for technical support regarding unfamiliar technological tools.

Supporting Evidential Reasoning

Planning. Interviews and field notes indicated that all participants used combinations of examples, embedded directions, or suggestions to align personal goals with course objectives to facilitate planning during inquiry cycles. Of these techniques, participants stated that embedded question prompts

demonstrated the greatest influence on scaffolding evidential reasoning. During the planning phase, participants answered questions designed to help select specific techniques related to active student engagement, indicate evidence likely to depict that engagement, and describe how evidence would inform their inquiry.

Inquiry cycles required participants to explore the manifestation of active student engagement in their everyday field experience. When initially completing inquiry tasks, all participants indicated that student engagement was not always observable. For example, Kristen stated within her first cycle that "[students] can be actively engaged without participating." During the planning phase of her second cycle Luan stated, "It's really hard for me to say 'look at that person… they're actively involved' because I know they don't have to be talking or anything like that to be actively engaged. I guess…their end product is going to show me if they are engaged or not." Ben made similar comments:

> "I don't even think that a student has to look like he's paying attention [to be actively engaged]. I had a student in one of my classes [that] I thought was asleep all day…But, every review question that I asked he had the answer to…I think it's something that is very difficult to gauge, which is why I struggle with a lot of these [inquiry] questions."

This perceived inability to directly observe engagement among some students led participants to consider how to represent evidence of active student engagement when selecting techniques and planning implementation activities. When queried as to how artifacts would inform them about the success of technique implementation and active student engagement, all participants indicated in at least one cycle that they would purposefully target and compare multiple sources of evidence in relation to each other to provide a nuanced representation of classroom practices. For example, during his first cycle, Kyle decided to call on particular students to increase their participation and engagement. While completing the planning phase of his inquiry cycle he wrote:

> Each record will show three different angles of student participation…The video recording will show visible evidence of students' [willingness] to participate…The teacher notes will show an

outsider's perspective of what the students are doing…the student work will show if student

participation correlated to…[their] effort in writing…and the quality of the writing assignment.

Comparisons across multiple sources of evidence were stated in 14 of the 18 total inquiry cycles (see

Table 5.1). Embedded question prompts helped all participants to consider potential evidence, state how

they might analyze it, and indicate how it might depict active student engagement in their classrooms. At

the beginning of her third cycle, for example, Kim planned to implement an activity where students take a

few moments to write and compare their thoughts with a partner before participating in a large-group

discussion. In response to embedded questions she wrote that she planned to compare students' written

responses with their participation and comments during discussions. These comparisons would allow her

to assess idea formation, refinement, and engagement by examining the quality of written versus verbal

responses and identifying argument formation and changes in opinion or presentation style based on

previous comments.

Examining evidence. As summarized in Table 5.1, all participants but Kyle compared and

contrasted multiple sources of evidence after implementing their chosen technique in one or more of 11

total inquiry cycles. In the remaining cycles, Ben and Kristen neither planned to nor analyzed

combinations of evidence during three cycles; Kim planned to analyze combinations of evidence but

failed to do so (examining evidence sources in isolation to each other). Despite indicating intent during

each planning cycle, Kyle failed to compare and contrast multiple sources of evidence during any cycle.

The other low enactor, Ben, engaged in evidential decision making only during his initial cycle. In

contrast, while Kim failed to compare and contrast multiple sources of evidence following her first cycle

implementation, she subsequently compared evidence during both her second and third cycles.

Modifying conclusions. Embedded questions also influenced and structured participants'

examinations of practice, prompting them to consider and test alternative hypotheses based on collected

evidence, and describe how evidence influenced conclusions based on alternative explanations. Based on

examination of evidence, all participants modified their initial assessments in at least one inquiry cycle.

During her final cycle, Kristen promoted active engagement by using a structured discussion protocol that

101

alternated discussion with silent note taking and argument formation. Following implementation she wrote, "For one of the first times, I truly felt like I successfully implemented an activity;" students exhibited on-task behavior and many voiced appreciation of the activity following the lesson. Review of student notes strengthened these claims; most notes indicated that students who remained silent were still involved with the activity and preparing arguments when their discussion time came. However, while reviewing video evidence in VAT, Kristen observed considerable "lag time" in initiating discussions and switching groups. Additionally, she noted that student discussions were frequently tangential and rarely "delved really deep into one or two issues." She concluded that while satisfied with the outcome, she wanted to include "a bit more structure to the…activity" by including prompts to "get the ball rolling." In all, participants modified initial claims within 10 of the 18 cycles as a result of analyzing collected evidence within LiveText and VAT and answering embedded question prompts. Within the other eight cycles, participants indicated that evidence examination helped them to strengthen and support initial claims.

Relying on tangible evidence to backup claims about practice also allowed participants to develop and implement improvement plans. At the conclusion of each inquiry cycle, participants were asked to describe how they would improve technique implementation in subsequent activities to increase active engagement in the classroom. In most cases, participants relied on findings discovered from evidence examination to suggest improvements. Embedded questions helped participants to focus their inquiries and to better structure their reflections. When asked at the conclusion of her second cycle to describe the purpose of eportfolio development using inquiry cycles, Luan stated "I think it's to reflect upon some of those things that you're doing…Like instead of just doing a lesson and thinking about it on my way home, I have to keep thinking about it— [the] work on this project asks me questions that maybe I'm not asking myself." The course instructor made similar comments,

> Most reflection has a fleeting quality about it (in that it happens). It is spoken; it is expressed, or it goes unspoken and happens in the minds of teachers…The inquiry project provides a structured

assignment that pushes [preservice teachers] to look closely at a piece of their practice and

affords me the opportunity to actually read and see [it].

Although all participants had reflected on their work in other assignments, inquiry cycles helped them to

focus on particular aspects of their practice, probe deeper, and document these processes for feedback,

review, and further reflection.

Coaching. While preservice teachers had access to extensive mentoring during eportfolio

production (e.g., field supervisor visits, cooperating teachers, peer critiques), few stated that they used

these supports to plan, collect, analyze, or draw conclusions regarding inquiry activities. Although

Kristen, Luan, and Kyle incorporated evidence generated by support personnel, they stated in both

interviews and field notes that they rarely discussed inquiry cycles with these individuals or other peers.

Only Dale and Ben communicated regularly with each other about inquiry ideas, examination methods,

and deadlines. Even though personal coaching did not appear critical to most participants, the lack of

coaching appeared to have adverse consequences for Kyle and Ben who struggled to implement evidential

reasoning during multiple cycles. Not only did they fail to compare and contrast evidence in five out of

six of their inquiry cycles (although initially examining or planning to examine practice this way), but

they also included unrelated evidence in multiple cycles or relied on preconceived notions (rather than

analysis findings) to form conclusions.

Additionally, while most participants indicated that they did not rely on coaching, direct

communication was often required to elicit rationales for evidence inclusion and its role in decision

making. Although participants described evidence plans and rationales at the beginning of each inquiry

cycle, these plans rarely provided sufficient details. For example, during his first cycle, Dale compared

his lesson plan, a video recorded discussion, and student work samples to determine whether planned

question prompts fostered and focused student participation, influenced observable engagement, and

prompted thoughtful responses. Yet, when identifying corresponding student work samples, it was

unclear whether included work represented individuals who participated during the discussion, those that

remained silent, those that generally performed well on written work, or those that improved during the

103

lesson. Furthermore, despite consistent and timely feedback from reviewers and the seminar instructor to include this information, few participants did so until specifically queried during interviews. Based of these findings, preservice teachers may need additional coaching and support to sufficiently describe evidence inclusion decisions.

Computer Demands

Although embedded scaffolds helped participants to implement evidential reasoning, they were insufficient to support some technology uses required for eportfolio development within inquiry cycles. Particularly, field notes, email correspondence, and interviews indicated that converting and uploading video to VAT, as well as aligning tagged segments to professional standards proved difficult for all participants. Because of limited familiarity and differences in residential, field experience, and university computer settings, participants experienced difficulties using VAT despite hands-on training sessions and embedded tutorials.

Technical familiarity. In response to questionnaires given at the beginning of the semester and subsequent interviews, participants indicated relative comfort using LiveText to complete eportfolio tasks. Even though few of them used the application since an introductory course taken two years previously, they mentioned feeling confident using the system because of these prior experiences and the applications similarity to electronic mail systems. Participants' comfort with VAT was much lower. During his final interview, for example, Kyle stated, "I was always looking at those [tutorials] to load videos into VAT…I guess it didn't really help [but] I don't think it has anything to do with the tutorials." Although Kyle attempted to upload his videos, his lack of familiarity with VAT, coupled with other technical problems hindered his success. Luan made similar comments during her final interview: "[The tutorials] were useful…The only thing that was my problem is that I'm not technical; the technology kind of threw me." Prior to eportfolio development, no participants had used VAT. Additionally, VAT functioned differently than computer applications familiar to most college students (e.g., office applications, instant messaging, and electronic mail). These differences made it difficult for participants to transfer knowledge of other software applications to navigate VAT.

104

Computer compatibility. All participants successfully converted, uploaded, and annotated videos in VAT during a hands-on training session using university computers previously checked for software and hardware compatibility. However, site-based computer incompatibilities hindered participant success during implementation. For example, after experiencing difficulties converting and uploading video to VAT on both her personal computer and computers located within her field experience school, Luan asked for assistance during her first cycle. She then discovered that system administrator settings prevented her from viewing and analyzing those videos from her student teaching site. Most field experience computers were administered by district technology coordinators who disabled participants' abilities to download and install browser plug-ins, view streaming media, or upload large files because of Internet security and bandwidth restrictions. Thus, many participants were forced to rely on university or residential computers (physically located externally to inquiry settings) to prepare, examine, and annotate eportfolio evidence.

Participants also experienced compatibility problems when attempting to use their personal computers. Although tutorials helped Ben to properly convert his video within his apartment and pass a VAT system test bundled for required plug-ins, he was unable to initialize a browser plug-in required to upload video to a remote streaming server. Eventually, he discovered that a competitor's plug-in was required for proper functionality. However, extensive and time-consuming trial-and-error phone support was required to overcome these complications. Other participants experienced difficulties using field experience or personal computers due to slow Internet connections, incompatible operating systems, low monitor resolution, and limited system access. Additionally, while all participants had access to high-speed Internet connections within their residences, these connections often provided high-speed downloading but much slower uploading. Because video files regularly exceeded 100 MB in size, participants often experienced remote server time-outs despite using FTP applications when using VAT from personal residences or student teaching schools.

Near the conclusion of participants' second inquiry cycles, the instructor underscored the complexity of implementing site- and residential-based inquiry cycles:

There is a significant technological challenge with doing the inquiry project…because [preservice teachers] are required to use video…It's not as if the technology is mystifying, but it's enough of something else that…if I didn't have [technical support] we wouldn't do it.

During his first inquiry cycle, for example, Dale successfully used tutorials to convert and upload video; however, the same computer did not recognize required components during his third cycle, nor did another computer he accessed. Eventually, Dale relied on technical support for video conversion and upload: "I had every instruction that I needed or easy access to it through email…But for the third one, for some reason I tried it on my computer and on another computer…and I couldn't get it to work." Even when participants relied on embedded training materials to use unfamiliar technologies, differences in computer systems often hindered their success and forced them to rely on technical support.

Competing Demands

Competing responsibilities also influenced participants' reliance on technical support. In addition to eportfolio requirements, participants prepared daily lessons, spent the entire workday within field experience schools, completed additional seminar assignments, applied for employment positions, worked part time jobs (in some cases), and tried to maintain a life outside of their profession. In her first interview, Kim stated:

During my student teaching, I find that I have absolutely no extra time what-so-ever…I'm, you know, really busy with doing the day to day stuff to prepare for my classes…Everyday I've spent studying the contents [students] are going to learn and planning lessons and just doing the assignments for our seminar that are due weekly…and working on the inquiry project.

Within seminar and during interviews, participants often stated that they felt overwhelmed. For example, during participants' second inquiry cycle, the instructor asked preservice teachers how to make seminar more useful to them. Among the responses, Dale stated that it was hard for him to pay attention after 7:30 PM because he had been working for over 12 hours that day and still needed to plan a lesson for the following day. Kristen, and Ben made similar comments, indicating that they "have been going full force since 6:00 AM" and were more concerned with finalizing the next day's lesson.

Participants also mentioned feeling responsible to their cooperating teachers and students. Because students would be tested at the end of the year, participants stated that they were ethically obligated to prepare and teach related materials rather than work on seminar and eportfolio tasks. All participants indicated in interviews and field notes that assignments due at the conclusion of the semester (regardless of their size) were ignored until field experiences concluded because they did not have the time to begin them.

Reliance on support. Given participants' limited familiarity with eportfolio tools, incompatible computer systems, and competing demands during field experiences, they relied extensively on technical support for VAT. During inquiry tasks, all participants sought technical support during at least two cycles. Although hands-on training sessions and access to tutorials provided step-by-step instructions for video capture, conversion, and analysis, four participants required technical assistance during two or more cycles. Even Kristen and Kim, who successfully converted and uploaded videos during each cycle, received email assistance within their first cycle to prepare videos for VAT and in subsequent cycles to apply rubrics to their videos.

Troubleshooting computer problems took considerable time among participants who arranged meetings at the university or set aside evenings to receive phone support. Often these sessions resulted in technical support personnel converting and uploading videos for preservice teachers because the seminar instructor did not want technology problems to over shadow program and course eportfolio objectives. Furthermore, once support personnel converted and uploaded videos, participants continued to rely on these tasks during the remainder of the semester, often bringing video tapes for support personnel to convert before attempting to do so themselves. In all, participants relied on technical support personnel to upload video within 10 of the 18 inquiry cycles. Although hand-on workshops, tutorials, and email support provided participants with procedures to effectively use technology tools for inquiry purposes, competing demands, limited tool familiarity, and computer incompatibilities reduced their willingness to complete tasks or trouble-shoot problems.

Discussion and Implications

Principles of evidentiary reasoning helped teachers to document key practices while simultaneously facilitating formative assessment and growth during eportfolio development. Inquiry cycles supported by technological tools including eportfolio templates, question prompts, and support documentation helped all participants to systematically identify, collect, and examine evidence in regards to specific teaching practices and to strengthen or modify conclusions. However, some inquiry processes also required extensive personal communication and coaching, particularly when unfamiliar technological tools were used to focus evidence examination.

Although two preservice teachers experienced problems and struggled to draw conclusions from their analyses in one or more inquiry cycles, embedded scaffolds helped all participants to develop plans for evidence inclusion that would account for the obscure nature of active engagement. These plans helped participants to consider classroom practices and their potential outcomes prior to implementing instruction, as well as to purposefully gather, organize, and examine evidence for professional improvement. Consistent with findings by Borko et al., (1997) and Whipp (2003), embedded prompts within portfolios helped preservice teachers to articulate explanations, consider alternative view-points, and develop reflective practices. Additionally, while some researchers found that preservice and beginning teachers lack sufficient experience to examine practice and inform decisions (e.g., Bryan & Abell, 1999; Carver & Katz, 2004; Rippon & Martin, 2006), we found that technological scaffolds helped most participants to inquire about specific teaching practices and articulate decisions using evidence. By using available scaffolds to triangulate findings, compare diverse evidence, and examine alternative explanations, participants reported that they were able to observe facets of classroom behavior previously overlooked. They also based their planning and decisions on tangible classroom evidence. Although preservice teachers are relative novices analyzing classroom events and individual teaching practices, embedded support structures within eportfolios helped them to focus their inquiries and justify conclusions.

Caution is needed when interpreting the findings of this study. During field experiences, preservice teachers received additional supports to help them examine and refine teaching practices, including discussions with cooperating teachers, field instructors, and peers. Preservice teachers also observed and critiqued each other twice during the semester and received similar observations three times from their field instructors. During these conversations, active student engagement was often discussed. Thus, the extent to which these conversations influenced inquiry cycle writings and conversations, and the eportfolio contents, is unknown. Both Kyle and Luan included evidence directly resulting from interactions with support personnel regarding technique implementations—not explicitly required by the eportfolio scaffolding.

Additionally, consistent with Delandshere and Arens (2003) findings, preservice teachers rarely included adequate explanations of their evidence to identify its purpose and relation to preservice teacher decisions. Although they received written feedback to clarify their rationales for including evidence or articulating how it was examined and used to inform decisions at the conclusion of each cycle, individual follow-up communication was required of all participants. Several possibilities may have influenced the lack of detail. As indicated, two participants were purposefully selected because of their lack of buy-in towards initial inquiry and seminar assignments. Additionally, some faculty members and support personnel questioned the value of the inquiry assignment, which may have affected student effort during cycle completion. Yet, three participants (Luan, Kim, and Katie) greatly exceeded several inquiry requirements—including and analyzing many sources of evidence to examine claims and implementing selected techniques multiple times over each four-week inquiry cycle. Furthermore, they stated within field notes and interviews that inquiry processes were beneficial in helping them systematically examine instructional techniques.

Another reason for insufficient details may be related to technical issues. Although preservice teachers used VAT to collect, identify, and tag key aspects of video evidence, tools were neither available for non-video evidence nor were question prompts tailored for specific evidence (e.g., asking why specific work samples were shown as compared to others, asking why lesson plans were or were not

109

included, etc.). Finally, since preservice teachers classroom practices were frequently observed by support personnel, they may have assumed details were self explanatory. Regardless of the reason, Wolfe, Whinery, and Hagerty (1995) advocated routine meetings with portfolio mentors so that preservice teachers can clarify and explain teaching practices through collected artifacts, and provide details that are otherwise missed. Similar meetings helped researchers in this study to obtain detailed explanations regarding evidence collection and analysis.

Although individual meetings helped to clarify teaching decisions, the potential for ongoing need raises questions of the viability of portfolios to promote and facilitate development over time. If portfolio documentation lacks sufficient rationale for why evidence is included or decisions are made, teachers will be limited when comparing and contrasting subsequent practices. Additionally, the time and resources needed for frequent one-on-one meetings with portfolio mentors may prove impractical. Consistent with reports by Rolheiser and Schwartz (2001) and Shepherd and Hannafin (2007), preservice teachers in the current study did not observe cooperating teachers or school personnel using eportfolios, conducting systematic inquiries into their teaching practices, or documenting written reflection of their teaching. Thus, they speculated whether such practices were valued or necessary in school settings and whether they would continue to develop them.

Longitudinal research is needed to examine the extent to which eportfolio practices inform and improve inquiry over time. At what point are coaches needed to elicit and expound upon eportfolio explanations and when can they be removed or augmented by technological scaffolds? Land and Zembal-Saul (2003) found that technological scaffolds within eportfolios facilitated skills acquisition if preservice teachers possessed initial background knowledge of the content being studied. Although direct communication may be necessary to fully describe decision-making processes among preservice teachers inexperienced with formal inquiry, research is needed to determine both the feasibility and support requirements of extended eportfolio development.

Recently, many teacher education programs have transitioned to electronic portfolios in part because of increased availability and sharability (Gatlin & Jacobs, 2002; Sherman, 2006). Unlike paper-

based portfolios, limited by physical boundaries and size, Internet-based eportfolios have been touted as being accessible from any location with Internet access (Sherman, 2006). Yet, our findings indicate that access alone may be insufficient; utilization may be more complicated than generally assumed. Indeed, many factors beyond to teacher's control (e.g., school policies and network settings, available hardware and software applications, limited bandwidth, etc.) may influence the extent to which teachers and key personnel can access eportfolios, making formative assessment difficult or impossible within many settings.

Access may be cause for further concern as teachers enter or move within the profession—particularly as they relocate across state or international boundaries where technology and support may not be available. Time and effort invested in documenting and analyzing initial or ongoing practices may prove of little or no use. If eportfolios are to promote sustained learning and inquiry, ongoing and pervasive support may be needed to ensure that eportfolio practices are supported beyond graduation and during transitions across school, district, and state boundaries.

Finally, similar to previous research (e.g., Borko et al., 1997; Carroll et al, 1996; Fallon & Watts, 2001), personal coaching was required for participants to sufficiently complete portfolio tasks. Personal communication in the form of follow-up interviews was provided to elicit complete descriptions of evidence inclusion and examination, and participants often used personal support to convert, upload, and analyze inquiry evidence. However, the extent to which participants required support is unclear. Although eportfolios can foster skills development, reflective practices, and holistic assessments, few researchers have examined the cognitive demands associated with their uses among pre- and inservice teachers. Whereas participants described themselves as technologically savvy, most continued to request extensive coaching—even following hands-on training, question and answer sessions, and access to online tutorials. Once preservice teachers realized help was available, they relied entirely on that support rather than attempting to resolve or troubleshoot on their own. Although reliance on external support may be contingent on its availability and competing demands for time and resources among pre- and inservice

111

teachers, research is needed to determine how supports can be applied and removed without creating

undue dependencies—human or technological.

Eportfolio development appears to support evidential reasoning among preservice teachers and

may prove useful to those interested in supporting teacher development. These findings corroborate, in

part, the largely unsubstantiated claims of advocates who promote eportfolios for formative teacher

development. However, the feasibility initiating and sustaining eportfolio practices throughout preservice

education and during teaching transitions (e.g., induction, career moves, etc.) has yet to be established.

Given the extensive demands and requirements of many eportfolio practices, research is needed to

examine technological needs, coaching alternatives, and technological scaffolds needed, and when and

how they can be introduced and removed to minimize dependency, cost, and burden while supporting

student learning.

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Table 5.1: Comparisons across multiple sources of evidence to ascertain active student engagement

	Participant	First Cycle[**]		Second Cycle		Third Cycle	
		Planned Evidence	Examined Evidence	Planned Evidence	Examined Evidence	Planned Evidence	Examined Evidence
Low Enactors	Ben	✓	✓				
	Kyle	✓		✓		✓	
Medium Enactors	Kristen	✓	✓			✓	✓
	Dale[*]	✓	✓	✓	✓	✓	✓
High Enactors	Kim	✓			✓	✓	✓
	Luan	✓	✓	✓	✓	✓	✓

[*] Although Dale planned and compared multiple sources of evidence across all cycles, he was designated as a medium participant because it was unclear whether he conducted multiple implementations per cycle and minimally completed assignment requirements

[**] Shaded cells indicate that participants collected required evidence but failed to examine it collectively.

| Introduction |
| Social Studies Education Rationale |
| Current Resume |
| Content and Curriculum |
| Knowledge of Students and their Learning |
| Learning Environments |
| Assessment |
| Planning and Instruction |
| Professionalism |

Inquiry cycle pages

| Inquiry Description and Tutorials |
| First Inquiry Cycle |
| Second Inquiry Cycle ▶ |
| Third Inquiry Cycle |

Selected page

How does this method/technique compare with what you are currently doing in your classroom?

What problems might occur as you employ this method and how might you deal with them?

Record Collection Plan (Please complete prior to record collection)   edit

How will you capture the implementation of your method/technique as records of practice? (e.g., a copy of your lesson plan, student work samples, video recordings, notes from your cooperating teacher, field instructor, or students, peer feedback, etc.)

How will your records inform you about your success in implementing your method/technique?

How will your records inform you about the effect of your method/technique in promoting active student engagement?

Evidence (Complete during and after record collection)   edit

Include your records of practice as attachments.

Immediately following your lesson(s) did you feel that you implemented your method/technique successfully? Explan.

Describe your initial reaction regarding the success of your method/technique in promoting active student engagement.

Explain how viewing and analyzing your records of practice altered, strengthened, or added to your initial reactions.

Figure 5.1. Sample question prompts within LiveText inquiry cycles

Figure 5.2. The Video Analysis Tool

- Select from a provided list of suggestions

- Write final conclusions and improvement plans in response to eportfolio questions

- Complete eportfolio questions to identify potential evidence and problems that may arise

Technique Selection

Conclusions

Planning

Evidential Reasoning

- Use VAT to examine videos
- Respond to eportfolio questions about analyzing evidence, implementation success, and alternative explanations

Evidence Analysis

Implementation

Evidence Collection

- Enact lessons with selected technique

- Respond to eportfolio questions regarding implementation success
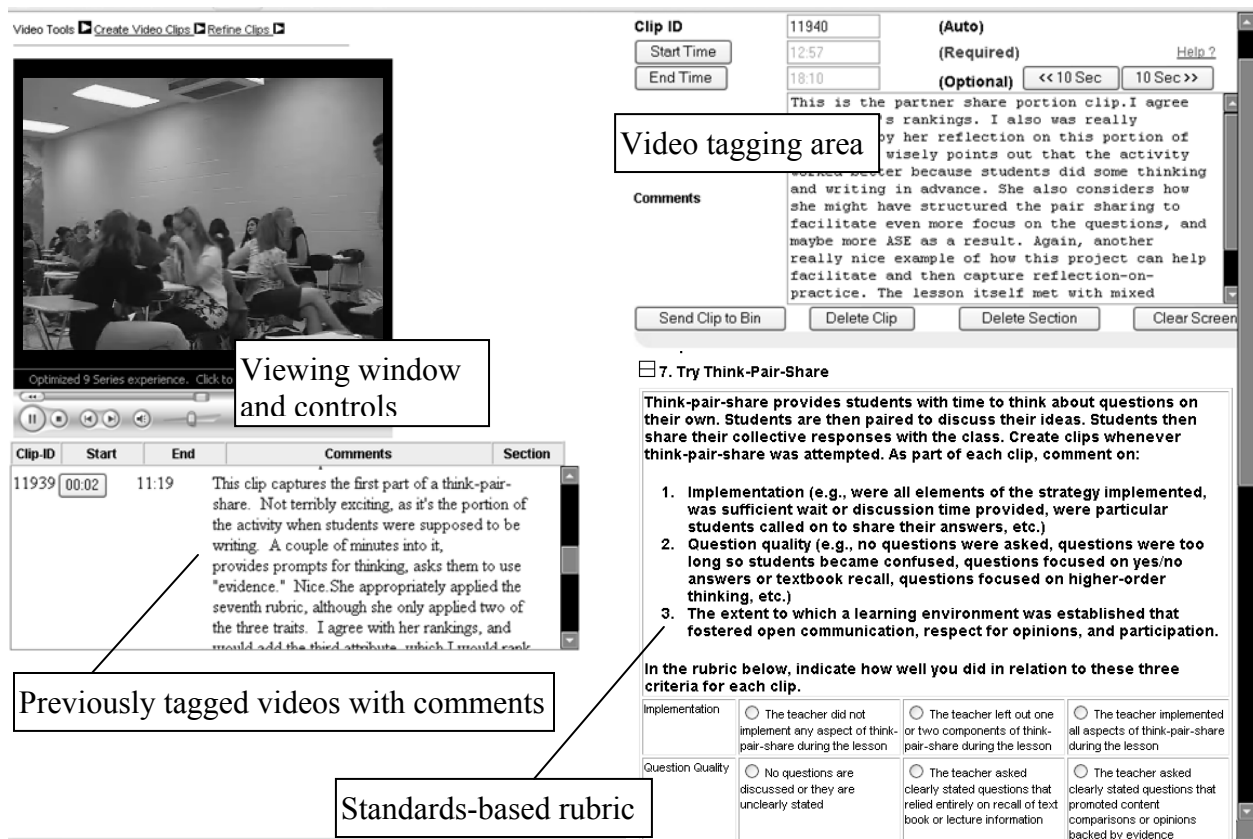- Record implementation
- Gather identified evidence

Figure 5.3. Inquiry cycle development using evidential reasoning methods

	Student Teaching			Post Student Teaching
First Inquiry Cycle	Second Inquiry Cycle	Third Inquiry Cycle		

Week 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

- Field experiences begin
- Technology training begins
- Demographic questionnaire
- Obtain parental consent forms
- Technique selection
- Planning begins
  - Evidence collection
    - Begin Analysis
  Draw conclusions •

- Participant's 1st interview

- Technique selection
- Planning begins
  - Evidence collection
    - Begin Analysis
  Draw conclusions •
  1st Instructor Interview •

- Participant's 2nd interview

- Technique selection
- Planning begins
  - Evidence collection
    - Begin Analysis
  Draw conclusions •

- Field experiences end
  - Participant's 3rd interview

  Semester ends •

  Grades submitted •

  2nd Instructor Interview •

Figure 5.4. Procedures timeline

CHAPTER 6

CONCLUSION

This dissertation contains three studies and a conceptual framework designed to guide a program

of research involving the use of evidence to support professional development and decision-making

among teachers at all stages of their careers. Thus, research regarding the uses of electronic portfolios

(eportfolios) and evidential reasoning tools is ongoing; findings from previous studies inform current

practices and support change within social studies eportfolio implementations. These changes include

additional scaffolds to support ongoing collaboration with preservice teachers, field instructors, and

cooperating teachers, a revamped Video Analysis Tool that facilitates the addition of streamed media

content and the creation of tagged video sections, and the separation of traditional and formative

assessment eportfolio components to facilitate assessment and review. We anticipate that findings from

these studies will continue to inform practices and enhance eportfolio implementations.

During the remainder of this chapter, I discuss three issues that emerged from this research and

examine how they might influence future research on the use of electronic portfolios to facilitate promote

formative assessment among teachers: Broadening implementation focus, increasing access, and

delineating coaching requirements.

Broadening Implementation Foci

Although researchers advocate portfolio uses at various stages in a teaching career (Johnson,

Mims-Cox, & Doyle-Nichols, 2006; NBPTS, 2006; Robinson, 2005; Zepeda, 2002), the majority of

research is conducted among teachers at specific time points rather than across career milestones and

experience levels (Chapter 2). Because of narrowly focused implementation, current research provides

snapshots of portfolio development but does not address their sustained use to support professional

development. Although many teacher education programs implement portfolio practices, Rolheiser and

Schwartz (2001) and Gatlin and Jacobs (1998) found that they are rarely supported or continued within

induction and inservice experiences. Participants made similar observations as documented within

121

chapters 3 and 4, describing a perceived lack of portfolio and reflective practices among inservice teachers and questioning whether such experiences were practical or supported.

While portfolio research addresses practices among preservice teachers, those entering induction experiences and those seeking advanced certifications, implementations are examined in relative isolation. With researchers advocating eportfolios as a means to capture holistic evidence of practice across a career (e.g., Anderson & Friesen, 2004), additional research is needed to study portfolio development across career milestones and experience levels. Particular emphasis should be placed on transition areas within the teaching career (e.g., entrance into induction experiences, school, grade, and subject changes) and their effects on eportfolio development and mentoring. Although researchers have generated lists of characteristics believed to promote successful portfolio development (e.g., Zeichner & Wray, 2001), they often fail to account for transitions that naturally occur within teaching. As researchers jointly examine portfolio practices among beginning and more experienced teachers, critical information may be gained regarding procedures to align objectives among pre- and inservice programs, promote collaborative exploration, and share technological resources to minimize resource requirements.

Delineating Coaching Requirements

As noted in chapters 3, 4, and 5, eportfolio development appears to support evidential reasoning among preservice teachers. Regardless of overall performance, prompts within portfolios helped all participants to focus inquiries on active student engagement, identify potential evidence to inform decisions, collect and examine that evidence related to professional standards, and develop plans for subsequent improvement. These findings corroborate findings of Borko, Michalec, Timmons, and Sidle (1997), Land and Zembal-Saul (2003), and Whipp (2003) who reported that embedded question prompts were particularly useful in supporting portfolio development and reflection.

Yet, in order to justify evidence inclusion criteria and their effects on eportfolio conclusions, preservice teachers required one-on-one sessions with eportfolio reviewers (Chapters 4 and 5). While many researchers indicate the need of coaching to foster portfolio development (e.g., Carroll, Potthoff, & Huber, 1996; Wolf, 1995; Zepeda, 2002), few have detailed roles that coaches should assume, when those

roles should be introduced, and how long they should be available. Results from chapter 5 suggest that preservice teachers relied extensively on coaching for technological support before attempting to troubleshoot their own problems. When taken collectively, these findings suggest that while coaching is necessary to document inquiry procedures sufficiently, some programs may require coaches to provide extensive administrative support, fostering an atmosphere of reliance rather than pedagogical support. Although these practices benefit teachers, they may place additional time and resource costs associated with portfolio development.

Delineating coaching needs is particularly important when exploring eportfolio practices that span the teaching career. Because teaching roles and experience levels fluctuate throughout the teaching career, it is probable that portfolio scaffolds will fluctuate too. More longitudinal studies are needed to ascertain coaching needs among teachers at various career stages, the extent to which they can be embedded within portfolio tools, and when and how they should be introduced and removed. Land and Zembal-Saul (2003), for example, found that eportfolio practices were useful when learners entered the experience with sufficient background knowledge in the subject being examined. Although beginning teachers often lack sufficient content knowledge and pedagogical skills to facilitate student learning (Carver & Katz, 2004; Norman & Feiman-Nemser, 2005), few researchers have examined the extent to which pre- and inservice teachers can support each other's portfolio practices, provide personal support required to adequately document evidence inclusion and analysis decisions, and foster joint collaboration.

Increasing Access

To extend the implementation range of portfolio practices, more emphasis is needed on making them accessible to teachers within school settings (Chapters, 2, 3, 5). Although eportfolios are believed to promote accessibility when housed within Internet-based applications, chapters 3 and 5 indicate that this access was often limited because of differing computer resources, security and privacy policies, and available Internet bandwidth among residential, school, and university computer systems. Physical access may be further limited when teachers relocate across district, state, and international boundaries, altering technology infrastructures and provided supports, and possibly alienating previous work. Yet, current

123

research fails to address these differences or provide suggestions to overcome them. Although it is irrational to expect that technology infrastructure will become standardized across district, state, and international boundaries, additional research on these differences and their effects on longitudinal eportfolio use is necessary to examine their worth for sustained professional development, particularly as the cadre of eportfolio packages narrows to a manageable list of major players.

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APPENDICES

APPENDIX A. ACTIVE STUDENT ENGAGEMENT HANDOUT (FIRST STUDY)

Active student engagement is the thoughtful, reflective, mindful activity by which learners receive, process, manipulate, judge, and/or interpret knowledge to enhance their understanding of subject matter. This process moves beyond memorization and recall because learners actively gather, evaluate, and organize information to uncover complex, contradictory, and abstract ideas or apply knowledge in flexible ways.

Although active student engagement occurs within individuals, various methods of assessment allow teachers to gauge its presence in their classrooms. For example, observable student behaviors may evidence active student engagement, including (but not limited to) comments or questions that synthesize prior learning, raise ideas that go beyond textbook or lecture materials, or situate knowledge in historical and cultural contexts. Non-verbal communication including facial expressions, seating position, and eye-contact may also reflect the degree of active student engagement. Whenever students are given opportunities to express their thinking (e.g., class discussions, written assignments, course projects), teachers are given opportunities to assess active student engagement. Below is a non-exhaustive list of attributes that relate to promoting active student engagement. This list will help you focus on one or two specific aspects of active student engagement during the first phase of portfolio construction.

Content and Curriculum
- Relating content area(s) to other subject areas and establishing connections to everyday life

Knowledge of Students and their Learning
- Being sensitive, alert, and responsive to all aspects of a child's well being
- Adapting work based on students' stages of development, multiple intelligences, learning styles, and areas of exceptionality
- Monitoring and adjusting teaching strategies in response to learner feedback
- Motivating members of the class to become invested in the content of a lesson (i.e. establishing "buy-in" to the intellectual work of the activity)

Learning Environments
- Creating a learning community in which students assume responsibility, participate in decision-making, and work both collaboratively and independently
- Using appropriate resources, materials, and technology to enhance instruction for diverse learners
- Using effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom
- Being sensitive to and using knowledge of individual student's cultures, experiences, and communities to sustain a culturally responsive classroom

Assessment
- Using pre-assessment data to select or design appropriate student learning goals
- Involving learners in self-assessment, helping them become aware of their strengths and needs and encouraging them to set personal goals for learning
- Employing formal and informal assessment tasks to reveal thoughtful, reflective, mindful activity by which learners receive, process, manipulate, and/or interpret knowledge to enhance their understanding of subject matter.
- Providing relevant and timely feedback to students

Planning and Instruction
- Engaging in planning as a collegial activity
- Incorporating a variety of instructional strategies to maintain student engagement and support the learning of all students
- Varying teacher roles in the instructional process (e.g. instructor, facilitator, coach, audience) in relation to the content and purposes of instruction and the needs of students
- Using appropriate resources, materials, and technology to enhance instruction for diverse learners
- Using effective questioning strategies to probe and foster student understanding

APPENDIX B. ELECTRONIC PORTFOLIO QUESTION PROMPTS (FIRST STUDY)

Method Collection Plan

What element of active student engagement that you are focusing on?

Please describe how this element relates to active student engagement?

List at least three settings in your classroom where you might observe your element of active student engagement over the next two weeks? (e.g., whole class discussions, assessments, planning, the learning environment you create in your room)

For each setting above, indicate what insights you might gain about active student engagement from collecting it.

For each setting mentioned above, indicate how you might capture it to store in your portfolio (e.g., video recording teaching episodes, lesson plans, student assessments).

Indicate if any elements listed above would provide similar insights about the element of active student engagement that you selected.

Based on your answers above, briefly write a plan to gather your portfolio evidence. Include a statement for each artifact indicating why you included it in your plan and when and how you will collect it.

Evidence Analysis

Briefly describe how this evidence exemplifies the element of active student engagement you selected.

What GTSM attribute(s) and level(s) does this evidence align to?

How does this evidence align to the attribute(s) and level(s)?

What information about your element of active student engagement is gained by including this evidence in your portfolio?

Analysis Summary

Please summarize what your evidence suggests about the element of active student engagement that you selected. Be sure to indicate how each piece of evidence contributes to your claims.

Based on what this evidence suggests, what are some things you could do to improve your teaching in this area?

Which of the above suggestions would be most effective in enhancing active student engagement in your classroom?

Please indicate why it would be most effective. This will be the focus of your portfolio development for the next three weeks.

Action Plan

What is your inquiry focus for the next three-week period (refer to your last inquiry)?

What might you do over the next three-week period to enact or improve this focus?

Are there any negative consequences that might arise by enacting these practices? If so, please describe them.

In one or two paragraphs please describe what you will do over the next three weeks to enact and improve your teaching in relation to the portfolio focus mentioned above.

APPENDIX C. INITIAL PRESERVICE TEACHER INTERVIEW PROTOCOL (FIRST STUDY)

Evidence Collection
1. Tell me about your evidence collection plan. How did you construct it?
2. What artifacts did you include in your evidence collection plan?
3. What aspects of these artifacts persuaded you to include them in your plan?
4. Is there anything you would have liked to include in your plan now that you have come this far in the process?
5. How strictly did you follow your plan during data collection?
6. Did you ever have to go back and alter your plan? What influenced you to do this?

Evidence Analysis
7. Once you collected your evidence what did you do with it?
8. What were some insights you gained from looking at your evidence?
9. Choose one piece of evidence in your portfolio. Please describe in detail how you analyzed that evidence?
10. Trying to make sense of evidence can be a little bit confusing at the beginning. Can you please describe for me how you initially examined your evidence and how that eventually led you to your current point of impact?
11. Did any alternative points of impact emerge during data analysis? What led you to choose your current point of impact?
12. Have you constructed an action plan yet? If so, could you share with me what you will do over the next two weeks?

Supports
13. What difficulties have you encountered constructing your portfolios? Can you describe one in detail?
14. Where have you gone to resolve these problems?
15. What other sources did you turn to for help while constructing your portfolio? How effective were these (ask about each one individually)?
16. Of the options mentioned in the last two/three questions, where is the first place you would go for portfolio-related support?
17. Of the options mentioned in the last two/three questions, where is the last place you would go for portfolio-related support?
18. What could we do to improve the next round of portfolio data collection?

APPENDIX D. SUBSEQUENT PRESERVICE TEACHER INTERVIEW PROTOCOL (FIRST STUDY)

Evidence Collection
1. What was your trigger for this cycle of evidence collection?
2. As part of your portfolio assignment you were asked to complete an evidence collection plan. Would you please tell me how you developed this plan?
   a. In your evidence collection plan you mentioned _____. Would you please talk more about that?
   b. Did you make any changes to this plan during the last 2 ½ weeks?
   c. What events influenced your decision to alter this plan?
3. What types of evidence did you consider when developing this plan?
4. How do these pieces of evidence relate to your trigger?
5. Did you consider other sources of evidence that do not appear in your final plan?
   a. What were these sources of evidence?
   b. What was your rationale for not collecting this evidence?
   c. How did you narrow down your evidence to what you finally selected?
6. How strictly did you follow your evidence collection plan?
7. Did you ever go back and alter your evidence collection plan after first uploading it? What prompted you to do this?
8. How did this round of evidence collection and analysis compare to the last one?

Evidence Analysis
9. Tell me about the evidence analysis worksheets.
10. Describe for me how you completed this worksheet using one artifact from your portfolio
11. What purpose do these worksheets have in portfolio construction?
12. What must evidence demonstrate to be included in your portfolio?
13. What was your course of action for this cycle of EBDS portfolio construction?
14. Would you describe how you reached this course of action by starting 2 ½ weeks ago when you identified your point of impact?
15. Did any alternative points of impact arise at the end of this cycle of portfolio construction?
    a. What were these possible alternatives?
    b. How did you decide to select your present point of action as opposed to these alternatives?

Supports
16. What difficulties did you encounter during this cycle of EBDS portfolio development?
17. How did you resolve these problems?
18. What supports would make portfolio development easier during the next 2 ½ weeks?
19. Tell me about your experience using LiveText over the past 2 ½ weeks.
20. Tell me about your experience using VAT over the past 2 ½ weeks?
    a. What additional supports would facilitate your use of these tools during the next cycle of portfolio construction?
21. How did this round of EBDS portfolio construction compare to the last one?
22. Last time we decided to try _____. How did its introduction affect this cycle of evidence collection?

APPENDIX E. INSTRUCTOR INTERVIEW PROTOCOL (FIRST STUDY)

1. How closely have you examined student portfolios at this point in the semester?
    a. What are some things you have noticed about them thus far?
    b. How are these portfolios compared to other semesters?
2. Tell me about students' use of artifacts in portfolios this semester?
    a. Does it differ much from previous years? How does it differ?
    b. Did these differences influence the final portfolio presented during the showcase?
    c. Does this difference affect how students wrote their synthesis papers about GSTEP standards related to assigned triggers?
3. What is(was) the biggest problem that a typical preservice teachers faced when constructing their portfolios this year?
    a. How did you address this problem?
    b. Were the results to your satisfaction?
4. What other challenges do typical preservice teachers face when constructing their portfolios in this class?
    a. How did you address these problems?
    b. How effective were your solutions?
5. What aspects of portfolio development do typical preservice teachers perform with ease?
6. Why are these tasks so easy for them?
7. Would you consider using EBDS methods for portfolio construction in subsequent semesters?
8. How do EBDS sections of preservice teacher portfolios compare with their non EBDS sections?
    a. How do EBDS sections of preservice teacher portfolios compare with previous portfolio sections from previous semesters?
9. Did preservice teachers focus on evidence related to their trigger during data collection?
    a. Why do you think this happened?
    b. What might you do differently to improve this process even more?
10. What artifacts would best represent the trigger you assigned them?
    a. What aspects of this artifact make it so worthwhile?
11. Have you encountered any artifacts that are inconclusive whether they relate to the trigger or not?
    a. What aspects of these artifacts make them ambiguous?
    b. What might the preservice teachers do to make them more relevant?

APPENDIX F. SUBJECTIVITY STATEMENT

Since 2001 I have developed electronic portfolios with preservice teachers. I believe that eportfolios have the potential to help preservice teachers critically examine their practices for purposes of development. However, I have not been encouraged with many of the implementations I have seen at Brigham Young University, Provo City School Districts, and the University of Georgia. Although pre- and inservice teachers were able to collect classroom artifacts and organize them according to state and national standards, I have not seen thoughtful, reflection based on these artifacts. Rather, teachers seem to include artifacts with brief captions describing what they are and force reviewers to rely on their own judgments to draw conclusions. Much literature states that preservice and beginning teachers lack sufficient experience in both personal inquiry and classroom instruction to adequately identify and attend to important classroom phenomena and critically analyze it for improvement purposes. Others suggest that coaches and mentors are required for effective eportfolio development. Although I believe that eportfolios can help preservice teachers to reflect on their practice (when certain supports are provided), I wonder whether time and resource requirements of faculty and preservice teachers could be better spent. Not only must preservice teachers expend much time and energy collecting, organizing, and reflecting upon classroom artifacts, but faculty members also expend time and energy mentoring eportfolio development, developing assessment criteria, and ensuring objective reviews. Do eportfolio gains outweigh costs, especially when few preservice teachers continue eportfolio development beyond graduation? Additionally, I am concerned that participants will be overly positive regarding the eportfolio project during interviews because I will be attending seminar with them on a weekly basis, providing technical support (as needed) and because they know that I am using this research for my dissertation.

In an attempt to reduce agreement bias among participants I will include multiple data sources from various groups of people. These include my own field notes, perceptions from the seminar instructor (e.g., portfolio feedback and assessments following each cycle, interviews, field notes), and participant generated data (e.g., demographic information, individual eportfolios, and interviews). Through these varied data sources I will be able to compare and triangulate received information to better validate my

arguments and claims. I will also remind participants in seminar and prior to each interview that their

feedback is instrumental in bettering the project for future semesters and that I would rather have critical,

honest responses than answers to make me feel good.

Researcher beliefs and assumptions influence how data is analyzed and evaluated, potentially

reducing the validity of outcomes. In an attempt to reduce my own biases regarding eportfolio

development I will use qualitative research software to both organize and document my analysis methods,

have regular meetings with my advisor to review and discuss tentative findings, and have experienced

qualitative researchers, external to this study, review a sample of my data and codes to examine

agreement. These efforts will better ensure that findings are representative of collected data rather than

generated selected through biased analyses.

APPENDIX G. ELECTRONIC PORTFOLIO ASSIGNMENT DESCRIPTION

During your twelve-week field experience you will participate in three inquiries about the effects of specific methods or techniques on active student engagement in your classroom. Each of these inquiries will last four weeks—beginning and ending on seminar days. You will be provided with a document describing active student engagement and suggesting methods and techniques to implement. A copy of this document is also attached below. After selecting one of these suggestions, you will complete a series of questions in the inquiry portion of your electronic portfolio. You will then spend the next two weeks gathering three or more examples of this method in your classroom. One of these examples must be a video recording—for those of you able to record in your classrooms. Other examples may include, lesson plans, student work samples (with names changed), written feedback from field instructors, cooperating teachers, students, or peers, written reflections following instruction, or anything else you deem worthy. If other course assignments (e.g., peer or field instructor observations) could be used as examples, you are encouraged to do so. Be sure to explain your rationale for inclusion of these documents in the inquiry sections of your portfolio. You will have a minimum of two weeks during each inquiry to examine the effect of your method or technique on active student engagement using these examples. During this time you may include other examples of your classroom practices to strengthen claims you make. There are questions in the inquiry portion of your portfolio to guide this analysis. When you finish examining your method or technique you will determine if you are satisfied with your efforts. If you are satisfied, you may select a new method or technique from the list of possible choices for your next inquiry cycle. If you are not satisfied, you may decide to continue examining your method or technique (or a related aspect of it) during the next four-week inquiry cycle. In total, you will complete three inquiry cycles.

Rationale
This assignment has been included in your student teaching experience for many reasons. Reflective teaching is emphasized in the College of Education and this assignment will help you systematically examine your practices and improve upon them. Being able to examine classroom practices through video or written feedback will help you focus on aspects of your teaching that may have otherwise been overlooked. These documents may also help you open communication lines between your cooperating teacher, field instructor, and others to receive encouragement and advice. This assignment will also help you gather artifacts for your portfolio throughout the semester and organize them in such a way to be useful for growth and development. We hope that as you gather examples of your teaching you will be able to see connections between GSTEP standards and your teaching rationale in your portfolio. Making these connections will greatly facilitate portfolio construction in this course.

Reports
Each of the three inquiries has a corresponding section in your LiveText portfolio. Reflective questions are provided in these sections to help you examine your practices. Each inquiry cycle will begin in seminar and conclude four weeks later in seminar. This means that this assignment will span your entire field experience. Completed inquiries will have at least three examples of your method (see description for examples) uploaded into your LiveText portfolio and all reflective questions answered in a way so that someone unfamiliar with your classroom could follow your reasoning for decisions made, examples selected, and conclusions drawn.

Scheduling
Each inquiry must be completed by the due date given in class. You will have a much easier time if you begin these assignments early—gathering examples of your method or technique within the first week or two and answering questions as you go. We recommend that you select your method or technique for each inquiry within one day of starting it. This will allow you to gather examples over the next two weeks and examine them during the following two weeks—answering the reflective questions as you go.

APPENDIX H. ACTIVE STUDENT ENGAGEMENT HANDOUT

Active Student Engagement

Active student engagement is the thoughtful, reflective, mindful activity by which learners receive, process, manipulate, judge, and/or interpret knowledge to enhance their understanding of subject matter. This process moves beyond memorization and recall because learners actively gather, evaluate, and organize information to uncover complex, contradictory, and abstract ideas or apply knowledge in flexible ways. Although active student engagement occurs within individuals, various methods of assessment allow teachers to gauge its presence in their classrooms. For example, observable student behaviors may evidence active student engagement, including (but not limited to) comments or questions that synthesize prior learning, raise ideas that go beyond textbook or lecture materials, or situate knowledge in historical and cultural contexts. Non-verbal communication including facial expressions, seating position, and eye-contact may also reflect the degree of active student engagement. Whenever students are given opportunities to express their thinking (e.g., class discussions, written assignments, course projects), teachers are given opportunities to assess active student engagement. Below is a non-exhaustive list of attributes that relate to promoting active student engagement. This list will help you focus on one or two specific aspects of active student engagement to focus on during the first phase of portfolio construction.

- **After giving directions for complex activities, check for understanding by asking students to explain directions back to you**

- **Organize class discussions around "essential" questions**
  Wiggins and McTye (1998, p. 28-30) state that essential questions go to the heart of the discipline, cannot be answered in one sentence, have no obvious "right" answer, raise other important questions, are framed to provoke and retain student interest, and recur throughout learning.

- **In leading class discussions, call on particular students to encourage their participation**

- **In leading class discussions, ask particular students to respond to the ideas/comments of a fellow student**

- **In leading class discussion, extend wait-time for students to respond to questions**
  Wait-time is the process of providing time for students to generate responses to a question, waiting for students to formulate words for an explanation, and listening as students put their questions into words.

- **Learn about your students' culture**

- **Ask students to discuss the relevance of whatever they're studying to their personal lives**

- **Have students take a few minutes to write out thoughtful responses before beginning a whole class discussion**
  Wait-time is the process of providing time for students to generate responses to a question, waiting for students to formulate words for an explanation, and listening as students put their questions into words.

- **Try Think-Pair-Share**
  The strategy of think-pair-share provides students with time to think about a particular question on their own so that they can analyze it, generate ideas, and formulate responses. Students are then paired with other class members to discuss their ideas and responses in a non threatening environment. Finally, students are allowed to share their collective responses with the class.

- **Use several resources in a lesson to address the needs of diverse learners**

- **Provide formative feedback to individual students**
  Formative feedback is the process of responding to student behaviors and activities in the classroom either through verbal, written, or non-verbal communication. Feedback is most effective when it is provided consistently and in a timely manner (as soon as possible after the behavior in question takes place.

APPENDIX I. ELECTRONIC PORTFOLIO QUESTION PROMPTS

Action Plan (Please complete prior to record collection)

What is the focus of your inquiry project (e.g., aspect of your practice, method, technique, or tool) for the next four-weeks?

How might this method/technique influence active student engagement in your classroom?

What you will do over the next four weeks to enact and improve your teaching in relation to the focus mentioned above? For example, describe the context and nature of the lesson(s) or activity(ies) in which you plan to attempt this method or technique of instruction.

How does this method/technique compare with what you are currently doing in your classroom?

What problems might occur as you employ this method and how might you deal with them?

Record Collection Plan (Please complete prior to record collection)

How will you capture the implementation of your method/technique as records of practice? (e.g., a copy of your lesson plan, student work samples, video recordings, notes from your cooperating teacher, field instructor, or students, peer feedback, etc.)

How will your records inform you about your success in implementing your method/technique?

How will your records inform you about the effect of your method/technique in promoting active student engagement?

Evidence (Complete during and after record collection)

Immediately following your lesson(s) did you feel that you implemented your method/technique successfully? Explan.

Describe your initial reaction regarding the success of your method/technique in promoting active student engagement.

Explain how viewing and analyzing your records of practice altered, strengthened, or added to your initial reactions.

How do you know if active student engagement stemmed from the method/technique you tried?

Are there alternative explanations that might have influenced active student engagement in your classroom?

How might you discern the extent to which your method/technique or these alternative explanations influenced active student engagement?

Analysis Summary

Are you satisfied with your findings from this inquiry cycle? Explan.

Based on your findings, what are some things you could do to further promote active student engagement in your classroom?

Will the results of this inquiry cycle become the focus of your next inqiry? If so, what aspect(s) will you focus on?

APPENDIX J. SUGGESTIONS FOR RECORDS OF PRACTICE

The following list contains a few suggestions of things you might include in your inquiry project to capture the degree of active student engagement in your classroom. If you think of other options that would be more relevant to your classroom activities feel free to use those instead.

- Classroom video – you are required to include at least one video of you implementing your method/technique for each inquiry cycle. These videos should not exceed 20 minutes and should be uploaded and analyzed in VAT (http://vat.uga.edu) using the ASESS rubric.

- Lesson Plan(s) or resources indicating what you intend to implement in your classroom (e.g., a list of potential questions to spark discussion and active engagement; written reflections about particular students, their engagement during class, and how you plan to encourage or support them.

- Include student work samples that demonstrate active engagement in the classroom (e.g., select assignments, quizzes, projects, etc.) – ask the student(s) permission before including these in your inquiry project. If possible, change the name in the assignment to protect their confidentiality too.

- Have your cooperating teacher take notes about your method/technique and its effects on active student engagement. Include a copy of these notes (and a summary of your discussion about them) in your inquiry project.

- Ask a peer to examine how you used your method/technique to promote active student engagement as part of their peer review. Include their comments and write-up in your inquiry project.

- Ask your field instructor to take notes about the use of your method/technique to promote active student engagement. Include these comments in your inquiry project.

- Video record discussions with your field instructor regarding active student engagement in your classroom and the method/technique you are focusing on.

- Following your use of a specific method/technique, ask students in your class to comment on its effectiveness in promoting their engagement in the lesson/topic. Include these comments (preferably written or recorded) in your inquiry project.

- If you continue examining a method/technique over multiple inquiry cycles you could use previous implementation videos, lesson plans, student work samples, etc. as baseline indicators for your current inquiry.

APPENDIX K. ACTIVE STUDENT ENGAGEMENT LENSES

After giving directions for complex activities, check for understanding by asking students to explain the directions back to you

While analyzing your video, create clips when you provided directions for students or feel that you should have provided directions. As part of each clip, comment on:

1. The clarity of your directions (e.g., are they organized procedurally, did you include everything you wanted students to do, did you include unrelated commentary or discussion)
2. The clarity of your question (e.g., did you ask students to repeat the directions? how? to whom?)
3. The extent to which you addressed student concerns, misrepresentations, and other questions.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Clarity of Directions	No directions are given to students	Directions are provided to students but they are disorganized or unclear	Clear, organized directions are provided to students
Quality of question	The teacher does not attempt to ask students to describe directions before beginning the activity	The teacher asks an unrepresentative sample of students to describe directions before beginning the activity (e.g., calling only on those students who traditionally answer correctly, ignoring students with confused or bored expressions, etc.)	The teacher asks a representative sample of students to describe directions before beginning the activity
Clarification of student feedback	The teacher does not attempt to clarify student misconceptions and concerns	The teacher attempts to clarify student misconceptions and concerns but does not do so adequately	The teacher clarifies student misconceptions and concerns as needed.

Organize class discussions around "essential" questions

Wiggins and McTye (1998, p. 28-30) state that essential questions go to the heart of the discipline, cannot be answered in one sentence, have no obvious "right" answer, raise other important questions, are framed to provoke and retain student interest, and recur throughout learning. When analyzing your video, create clips when you organized class discussions or feel that you should have organized a discussion around essential questions. As part of each clip, comment on:

1. Class representation in the discussion (e.g., the teacher lectured the whole time, only those students who always answer questions participated, all students participated, etc.)
2. The extent to which essential questions were discussed
3. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Class Representation	The teacher dominated the discussion.	Only some students participated in the discussion but not all of them.	All students participated in some form in the discussion.
Focus on Essential Questions	The discussion is not related to essential questions.	The discussion begins addressing essential questions but moves in an unrelated direction.	The discussion focuses exclusively on essential questions or the teacher quickly brings the discussion back to them when deviations occur.
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.

In leading class discussions, call on particular students to encourage their participation

When analyzing your video, create clips when you had class discussions or feel that you should have had discussions. As part of each clip, comment on:

1. Student representation in the discussion (e.g., the teacher lectured the whole time, only those students who always answer questions participated, the teacher called on specific students to increase their participation, describe alternative viewpoints, etc.)
2. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Student Representation	The teacher did not call on particular students to encourage their participation/ viewpoint	The teacher called on particular students and encouraged their participation/ viewpoint	
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

In leading class discussions, ask particular students to respond to the ideas/comments of fellow students

When analyzing your video, create clips when you had class discussions or feel that you should have had discussions. As part of each clip, comment on:

1. Student representation in the discussion (e.g., the teacher lectured the whole time, only those students who always answer questions participated, the teacher called on specific students to increase their participation, describe alternative viewpoints, etc.)
2. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Student Representation	The teacher did not call on particular students to encourage their participation/ viewpoint	The teacher called on particular students to encourage their participation/ viewpoint	
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

In leading class discussion, extend wait-time for students to respond to questions

Wait-time is the process of providing time for students to generate responses to a question, waiting for students to formulate words for an explanation, and listening as students put their questions into words. When analyzing your video, create clips when you provided wait-time or feel that wait-time should have been provided. As part of each clip, comment on:

1. Wait-time (e.g., was wait-time provided? How much? How did it compare with previous attempts at extending wait time? Did everyone receive enough time?)
2. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Extending Wait-Time	The teacher did not extend wait-time beyond what was normally given	The teacher extended wait-time a little bit but not enough for some students to adequately collect their thoughts	The teacher adequately extended wait-time for all students in the classroom
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

Ask students to discuss the relevance of whatever they're studying to their personal lives

When analyzing your video, create clips whenever you discussed content relevance or feel that such a discussion should have occurred. As part of each clip, comment on:

1. Class representation in the discussion (e.g., the teacher lectured the whole time, only those students who always answer questions participated, all students participated, etc.)
2. Wait-time is the process of providing time for students to generate responses to a question, waiting for students to formulate words for an explanation, and listening as students put their questions into words. Was wait-time provided? How much? How did it compare with previous attempts at extending wait time? Did everyone receive enough time?
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Class Representation	The teacher never asks why the content matters	The teacher asks why the content matters but relies entirely on student who always participate.	The teacher called on particular students to encourage their participation/viewpoint in light of personal interests
Wait-time	The teacher did not provide adequate wait-time for students to organize their thoughts	The provided adequate wait-time for students to organize their thoughts	
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

Try Think-Pair-Share

The strategy of think-pair-share provides students with time to think about a particular question on their own so that they can analyze it, generate ideas, and formulate responses. Students are then paired with other class members to discuss their ideas and responses in a non threatening environment. Finally, students are allowed to share their collective responses with the class. When analyzing your video, create clips whenever think-pair-share was attempted. As part of each clip, comment on:

1.   Implementation (e.g., were all elements of the strategy implemented? Was sufficient thinking time provided? Did students have adequate time to discuss their answers with their partners? Was a representative sample of students asked to share their final answers with the class? etc.)
2. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Implementation	The teacher did not implement any aspect of think-pair-share during the lesson	The teacher attempted to implement think-pair-share but left out one or two components during the lesson	The teacher implemented all aspects of think-pair-share during the lesson
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect during the activity	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

Have students take a few minutes to write out thoughtful responses before beginning a whole class discussion

Wait-time is the process of providing time for students to generate responses to a question, waiting for students to formulate words for an explanation, and listening as students put their questions into words. In this case, students will also use this time to write out thoughtful responses to questions before beginning the discussion. When analyzing your video, create clips when you provided wait-time or feel that wait-time should have been provided. As part of each clip, comment on:

1. Prompting wait-time (e.g., was wait-time provided? How much? How did it compare with previous attempts at extending wait time? Did everyone receive enough time?)
2. The quality of discussion questions (e.g., no questions were asked, questions were too long so students became confused about what was asked, questions focused on short yes/no answers or textbook repetitions, students focused on content syntheses and higher-order thinking, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Prompting Wait-time	Prior to the discussion the teacher did not provide time for students to collect and write down their thoughts regarding a specific question(s)	Prior to the discussion the teacher prompted students to collect and write down their thoughts regarding a specific question(s) but did not provide adequate time for responses	Prior to the discussion the teacher prompted students to collect and write down their thoughts regarding a specific question(s) and provided adequate time for responses
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

Learn about your students' culture

When analyzing your video, create clips whenever knowledge of student culture was evident or where you feel that culturally relevant examples and activities should have been provided. As part of each clip, comment on:

1. Knowledge of student needs and interests (e.g., lesson resources, examples, and discussions demonstrate knowledge of student needs, the teacher addressed the needs of some but not all students through activities or learning strategies, etc.)
2. Culturally relevant examples (e.g., the teacher used examples that most students did not relate to, the teacher incorporated student interests and backgrounds while exemplifying course concepts, the teacher used several examples to help several students grasp difficult concepts, etc.)
3. The extent to which a learning environment was established that fostered open communication, respect for opinions, and participation.

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Knowledge of students' needs and interests	The teacher did not use any information about students' developmental levels, previous experience, needs or, interests to support students active engagement in the lesson	The teacher used general knowledge of the developmental levels and previous experiences of the class as a whole to support students active engagement in the lesson	The teacher utilized specific knowledge of individual developmental levels, needs, interests and previous experiences to support students' active engagement in the lesson.
Culturally Relevant Examples	The teacher does not use culturally relevant examples to help students understand concepts presented in the lesson	The teacher uses examples that are culturally relevant to some students but fails to provide culturally relevant examples for other students	The teacher uses a variety of diverse examples to help all students understand concepts presented in the lesson
Learning Environment	The teacher does nothing to foster an environment of respect during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

Use various resources in a lesson to address the needs of diverse learners

When analyzing your video, create clips where the use of various resources in your classroom was evident or where you feel that they should have been used. As part of each clip, comment on:

1. The variety of resources (e.g., indicate if little or no resources were used, identify whether several resources were used but they all had similar functionality, etc.)
2. How specific resources were selected for lesson inclusion (e.g., they were readily available, I thought they would help John understand the content better, the teacher edition recommended them, etc.)
3. Knowledge of student needs and interests (e.g., lesson resources, examples, and discussions demonstrate knowledge of student needs, the teacher addressed the needs of some but not all students through activities or learning strategies, etc.)

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Resource Variety	The teacher lectured from the textbook the entire lesson	Teacher provided one or two learning tasks or resources to supplement the lesson	Teacher provides a wide range of learning tasks and resources to target specific student needs
Resource Selection	Resources were selected primarily based on their availability in the school	Resources were selected primarily on their ability to diversify classroom presentation	Resources were selected primarily on their ability to meet specific student needs and interests
Knowledge of students' needs and interests	The teacher did not use any information about students' developmental levels, previous experience, needs or, interests to support students active engagement in the lesson	The teacher used general knowledge of the developmental levels and previous experiences of the class as a whole to support students active engagement in the lesson	The teacher utilized specific knowledge of individual developmental levels, needs, interests and previous experiences to support students' active engagement in the lesson.

Provide formative feedback to individual students

Formative feedback is the process of responding to student behaviors and activities in the classroom either through verbal, written, or non-verbal communication. Feedback is most effective when it is provided consistently and in a timely manner (as soon as possible after the behavior in question takes place. When analyzing your video, create clips where student feedback was given or where you feel that student feedback should have been provided. As part of each clip, comment on:

1. How representative your feedback is (e.g., do your comments address specific elements of the students work? Are they based on past performances but not necessarily this one? Do you give general comments to the class and not to individual students?)
2. What is the content of your feedback? (e.g., do you focus primarily on student or classroom deficiencies or progress? Do you provide insights about how the class or individual could improve? Do you focus on specific aspects of their work or on their work in general?)
3. How timely is your feedback (e.g., when do students receive the feedback in relation to when they completed the activity in question? How consistent do you provide feedback? Do you provide this level of timeliness and consistency to all students in your class?)

In the rubric below, please indicate how well you did in relation to these three criteria for each clip.

Feedback Representativeness	The teacher does not provide feedback to students	Teacher feedback focuses on general classroom practices rather than on individual needs.	Teacher feedback focuses on individual practices and targets specific aspects of their work.
Feedback Content	Teacher feedback focuses primarily on student deficiencies	Teacher feedback focuses primarily on student progress	Teacher feedback, whether primarily focusing on deficiencies or progress clearly articulates how student growth can be achieved
Feedback Timeliness	Feedback is not provided in a consistent or timely manner	Feedback is provided in a consistent or timely manner	

APPENDIX L. LENS ALIGNMENT

After giving directions for complex activities, check for understanding by asking students to explain the **directions back to you**

Clarity of Directions	No directions are given to students	Directions are provided to students but they are disorganized or unclear	Clear, organized directions are provided to students
Quality of question	The teacher does not attempt to ask students to describe directions before beginning the activity	The teacher only asks an unrepresentative sample of students to describe directions before beginning the activity (e.g., calling only on those students who traditionally answer correctly, ignoring students with confused or bored expressions, etc.)	The teacher asks a representative sample of students to describe directions before beginning the activity
Clarification of student feedback	The teacher does not attempt to clarify student misunderstandings or concerns when they arise	The teacher attempts to clarify student misunderstandings or concerns but does not do so adequately	The teacher clarifies student misunderstandings and concerns as they arise.

TSM	**Basic**	**Proficient**	**Advanced**
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher focuses on student participation as a way to reward only the best students and their involvement.	Teacher modifies their learning environment organization to provide for the most needy students.	Teacher provides a learning environment organized to address individual student needs.
Learning environments: Demonstrates effective classroom management. (3C)	Teacher communicates expectations of student behavior as well as the consequences.	Teacher uses strategies to stop disruptive behavior and reinforce expectations.	Teacher reinforces expectations and consequences and develops strategies to prevent problematic situations.

Organize class discussions around "essential" questions

Class Representation in Discussion	The teacher dominated the discussion.	Only some students participated in the discussion but not all of them.	All students participated in some form in the discussion.
Focus on Essential Questions	The discussion is not related to essential questions.	The discussion begins addressing essential questions but moves in an unrelated direction.	The discussion focuses exclusively on essential questions or the teacher quickly brings the discussion back to them when deviations occur.
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.

TSM	**Basic**	**Proficient**	**Advanced**
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Planning and instruction: Teacher informs students of what they will be learning by referencing the standard/objective or an "essential question" derived from the standard. (5B)	Teacher "tells" students what they will be learning based on text or program	Teacher writes some form of objective on the board or chart to let students know what they are expected to be taught.	Teacher informs students of what they will be learning by referencing the standard/objective or an "essential question" derived from the standard.

In leading class discussions, call on particular students to encourage their participation

Student Representation	The teacher did not call on particular students to encourage their participation/viewpoint	The teacher called on particular students and encouraged their participation/viewpoint	
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.
2a achievement goals			

In leading class discussions, ask particular students to respond to the ideas/comments of fellow students

Student Representation	The teacher did not call on particular students to encourage their participation/viewpoint	The teacher called on particular students to encourage their participation/viewpoint	
Question Quality	No questions are discussed or they are unclearly stated	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.

In leading class discussion, extend wait-time for students to respond to questions

Extending Wait-Time	The teacher did not extend wait-time beyond what was normally given	The teacher extended wait-time a little bit but not enough for some students to adequately collect their thoughts	The teacher adequately extended wait-time for all students in the classroom
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.

Ask students to discuss the relevance of whatever they're studying to their personal lives

Class Representation	The teacher never asks why the content matters	The teacher asks why the content matters but relies entirely on student who always participate.	The teacher called on particular students to encourage their participation/viewpoint in light of personal interests
Wait-time	The teacher did not provide adequate wait-time for students to organize their thoughts	The provided adequate wait-time for students to organize their thoughts	
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Learning environments: Motivates students to engage in learning activities. (3D)	Teacher occasionally discusses the relevance of the learning material to students' lives.	Teacher often emphasizes the relevance of the learning material to students' lives through regular activities.	Teacher uses creative activities to help students discover the relevance of the learning material to their own lives.
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.

Try Think-Pair-Share

Implementation	The teacher did not implement any aspect of think-pair-share during the lesson	The teacher attempted to implement think-pair-share but left out one or two components during the lesson	The teacher implemented all aspects of think-pair-share during the lesson
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.

Have students take a few minutes to write out thoughtful responses before beginning a whole class discussion

Prompting Wait-time	Prior to the discussion the teacher did not provide time for students to collect and write down their thoughts regarding a specific question(s)	Prior to the discussion the teacher prompted students to collect and write down their thoughts regarding a specific question(s) but did not provide adequate time for responses	Prior to the discussion the teacher prompted students to collect and write down their thoughts regarding a specific question(s) and provided adequate time for responses
Question Quality	No questions were asked or they were unclearly stated.	The teacher asked clearly stated questions that relied entirely on recall of text book or lecture information	The teacher asked clearly stated questions that moved beyond information recall by promoting content comparisons or informed opinions backed by evidence.
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	**Basic**	**Proficient**	**Advanced**
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	Teacher develops assessment that incorporate rubrics that allow students to self-evaluate their progress
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies formative and summative assessments appropriately. (4A)	Teacher generates one assessment to be administered to the class as a whole	Teacher generates multiple assessments to determine class performance and individual student needs	Teacher adapts assessments dynamically to address the needs of individual students
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.

Learn about your students' culture

Knowledge of students' needs and interests	The teacher did not use any information about students' developmental levels, previous experience, needs or, interests to support students active engagement in the lesson	The teacher used general knowledge of the developmental levels and previous experiences of the class as a whole to support students active engagement in the lesson	The teacher utilized specific knowledge of individual developmental levels, needs, interests and previous experiences to support students' active engagement in the lesson.
Culturally Relevant Examples	The teacher does not use culturally relevant examples to help students understand concepts presented in the lesson	The teacher uses examples that are culturally relevant to some students but fails to provide culturally relevant examples for other students	The teacher uses a variety of diverse examples to help all students understand concepts presented in the lesson
Learning Environment	The teacher does nothing to foster an environment of respect in regards to others comments during the discussion	The teacher sets rules/parameters for the discussion to encourage an environment of respect but does not adequately enforce them.	The teacher sets rules/parameters for the discussion to encourage an environment of respect and adequately enforces them.

TSM	Basic	Proficient	Advanced
Content and curriculum: Applies and connects curriculum to related subjects and students' lives. (1D)	Not developed	Not developed	Not developed
Knowledge of students and their learning: Supports development based on student readiness. (2B)	Teacher displays generally accurate knowledge of developmental characteristics of age groups	Teacher displays thorough understanding of typical developmental characteristics of age group as well as exceptions to patterns	Teacher displays knowledge of typical developmental characteristics of age groups, and the extent to which each student follows patterns
Knowledge of students and their learning: Adapts instruction based on individual student development, readiness, learning styles, and special needs (2E)	Teacher recognizes the value of understanding students' interests or cultural heritage but only for the class as a whole	Teacher displays knowledge of interests and cultural heritage of groups and recognizes the value of this knowledge when planning lessons	Teacher displays knowledge of the interests of groups or cultural heritage of individual students and utilizes this knowledge when planning lessons
Learning environments: Establishes a participatory, democratic learning community. (3A)	Teacher provides a learning environment that focuses on the common needs of all students.	Teacher adapts their learning environment to meet the needs of some students.	Teacher provides a learning environment adapted dynamically to address the needs of individual students.
Learning environments: Establishes and maintains a culturally responsive classroom reflecting differences in student backgrounds. (3E)	Teacher recognizes the value of the class' cultural, religious heritage.	Teacher uses an understanding of the cultural and religious heritage of students to create and carry out learning activities.	Teacher uses an understanding of the cultural, religious, and familial heritage of each student to create and carry out individualized learning activities.

Use various resources in a lesson to address the needs of diverse learners

Resource Variety	The teacher lectured from the textbook the entire lesson	Teacher provided one or two learning tasks or resources to supplement the lesson	Teacher provides a wide range of learning tasks and resources to target specific student needs
Resource Selection	Resources were selected primarily based on their availability in the school	Resources were selected primarily on their ability to diversify classroom presentation	Resources were selected primarily on their ability to meet specific student needs and interests
Knowledge of students' needs and interests	The teacher did not use any information about students' developmental levels, previous experience, needs or, interests to support students active engagement in the lesson	The teacher used general knowledge of the developmental levels and previous experiences of the class as a whole to support students active engagement in the lesson	The teacher utilized specific knowledge of individual developmental levels, needs, interests and previous experiences to support students' active engagement in the lesson.

TSM	Basic	Proficient	Advanced
Learning environments: Engages students in learning tasks through the effective management and allocation of classroom resources. (3B)	Teacher provides a limited range of learning tasks based on readily available resources.	Teacher varies the tasks and resources as possible within the instructional program limitations.	Teacher provides a wide range of learning tasks and resources from a wide range of sources based on student interests and needs.
Learning environments: Engages students in learning tasks through the effective management and allocation of classroom resources. (3B)	Teacher uses the same approaches and resources for all students regardless of interests and needs.	Teacher modifies their approaches and use of resources when necessary to meet emergent opportunities to engage groups of students with similar interests and needs.	Teacher consistently develops and modifies approaches and resources dynamically as needed by individual learners based on their interests and needs.
Planning and instruction: Utilizes varied resources to address the needs of diverse learners. (5F)	Teacher primarily utilizes resources recommended and provided by textbook and program publishers.	Teacher supplements textbook and program recommendations with easily acquired resources.	Teacher seeks out a wide range of resources appropriate to the specific learning intended for all students.

Provide formative feedback to individual students

Feedback Representativeness	The teacher does not provide feedback to students	Teacher feedback focuses on general classroom practices rather than on individual needs.	Teacher feedback focuses on individual practices and targets specific aspects of their work.
Feedback Content	Teacher feedback focuses primarily on student deficiencies	Teacher feedback focuses primarily on student progress	Teacher feedback, whether primarily focusing on deficiencies or progress clearly articulates how student growth can be achieved
Feedback Timeliness	Feedback is not provided in a consistent or timely manner	Feedback is provided in a consistent or timely manner	

TSM	Basic	Proficient	Advanced
Knowledge of Students and their Learning: Demonstrates rapport with students and respect for child's well-being (2C).	Teacher feedback to students generally supports student learning	Teacher feedback to students is consistently timely and focused in an effort to promote student growth	
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are used to document student performance and provide whole class feedback	Classroom assessments are used to provide group feedback, and plan corrective intervention	Classroom assessments are used to provide individual feedback, identify areas of weakness and plan corrective action
Assessment: Applies classroom-based assessments to plan, teach, and provide student feedback. (4C)	Classroom assessments are provided at least(?) weekly to monitor and document student performance	Classroom assessments are provided regularly and are used to provide students with timely, targeted feedback	Classroom assessments are administered frequently to provide immediate student feedback and teacher information in order to adjust instruction
Assessment: Monitors student progress and encourages students to monitor their own progress. (4D)	Teacher uses assessments to monitor and document progress	Teacher uses assessment to monitor student progress and provide feedback to students	
3d success experience			

APPENDIX M. INITIAL PRESERVICE TEACHER INTERVIEW PROTOCOL

What is the purpose of the portfolio?

What do you hope to get out of the portfolio that you are creating?

Is that expectation being realized?

What does [the seminar instructor] expect you to get out of this inquiry assignment that you are completing?

What will you do with your portfolio post graduation?

Have you begun your portfolio yet? When will you begin it?

What is the purpose of the inquiry project?

How did you go about selecting your technique for the first inquiry cycle?

How did you examine that technique in your classroom?

What evidence did you include about your technique in your inquiry project?

What were you looking for?

What did you notice as you examined your video?

Did you examine this technique in more than one lesson?

You included several work samples? Can you describe what you looked for in those work samples?

Why did you include the work samples you did and not others?

What does active student engagement look like?

How did you go about answering the questions in the inquiry project?

Did the questions lend themselves to answers that included multiple lessons?

Who have you talked to about your inquiry project? What information did they provide you with?

If there is one thing you could change about the portfolio or inquiry project what would it be and why?

APPENDIX N. SUBSEQUENT PRESERVICE TEACHER INTERVIEW PROTOCOL

What was the purpose of the portfolio this semester?

When did you begin constructing your portfolio?
>   To what extent did the weekly assignments in seminar help with this?

What was the purpose of the inquiry project this semester?

What will you take from your portfolio/inquiry project post graduation?
- Is there a disconnect between what you did and what you saw teachers do/say?

How did you go about selecting your method for your final inquiry project?

How did you determine the success of your method during this inquiry cycle?

What is active student engagement?

Look at VAT clips.
- What indicators did you look for in your video to indicate the success of your method?
- What indicators did you look for in your video to indicate ASE?
- What rubric did you select to analyze your video?
- How useful was the rubric for analyzing your video and drawing conclusions about your method? Why or why not?
- Would you have generated the same decision without using the rubric?
- Is there anything you would have liked to change about the rubric or the video analysis process?

Go through each piece of evidence.
- For what reason was this piece included (as opposed to others)?
  - What type of work does it represent? Whose work? Is the individual included in the video?
- How specifically did it inform you about the success of your method?
- How did it inform you about the level of ASE in your classroom?

How did you go about completing the inquiry questions for this portfolio round?

When you had questions about the portfolio/inquiry who did you go to? Neighbors, Cooperating Teacher, Field Instructor, classmates?

If there is one thing you could change about the portfolio/inquiry project what would that be and why?

Code the 2nd VAT clip and ask rubric questions

APPENDIX O. INITIAL INTSTRUCTOR INTERVIEW PROTOCOL

What is the purpose of the inquiry project this semester?

What would indicate that a student inquiry project was successful?

What is the purpose of the portfolio this semester?

What would indicate that a student portfolio was successful?

What is active student engagement?

What does it look like in the classroom? How would you be able to examine that?

What are your thoughts about the methods/techniques that students have selected thus far?

What is the purpose of including records of practice in the inquiry cycles?

Was that purpose realized? How can you tell?

How can you tell if someone is "going through the rounds" versus systematically reflecting on their inquiry project?

What might we do to improve the inquiry project?

What do you like about the inquiry cycles?

What have you disliked about them?

How does the inquiry project compare with the portfolio? What is similar? What is different?

What typical challenges do preservice teachers face when constructing their inquiry projects? How are they mitigated?

Have any students approached you about challenges they experienced during the inquiry project? What?

Have any students approached you about challenges they experienced during the portfolio? What?

If there is one thing that you could change about the portfolio or the inquiry project for next semester, what would it be?

APPENDIX P. SUBSEQUENT INTSTRUCTOR INTERVIEW PROTOCOL

What was the purpose of the inquiry project last semester?

What was the purpose of the portfolio last semester?

What indicated that a student portfolio was successful?

What is active student engagement?

What does it look like in the classroom? How would you be able to examine that?

What is the purpose of including records of practice in the inquiry cycles?

How could you tell if someone was "going through the rounds" versus systematically reflecting on their inquiry project?

What was successful about the inquiry project?

What wasn't successful about the inquiry project?

What was successful about the portfolio last semester?

What wasn't successful about the portfolio last semester?

How did artifacts collected this semester compare with those of previous semesters?

How does the inquiry project compare with the portfolio? What is similar? What is different?

What challenges did preservice teachers face when constructing portfolios? How were they mitigated?

Did any students approach you about challenges they experienced doing the inquiry project? What?

Did any students approach you about challenges they experienced doing the portfolio? What?

If there is one thing that you could change about the portfolio or inquiry project for next semester What would it be and why?

APPENDIX Q. SAMPLE CODEBOOK

Category	Indicator	Definition	Examples
Indicators of active engagement	Between students Comparison	Contrasting the behaviors of two or more different students within the same lesson to ascertain their level of active engagement	but in viewing the videos, I think you can kind of pinpoint more or less like at least if you compare the students. You know like which one is more engaged and which one is not. I think too that it's not necessarily a completely engaged and not at all engaged. You know, maybe, for the most part the student is you know pretty much engaged in the assignment or the activity you know, this student is really engaged, this one is just kind of listening and kind of working on other work at the same time kind of thing.
	Within student comparison	Comparing student involvement and work to that completed in previous lessons to ascertain their level of active engagement	the work kids turned in blew me away, how much they were applying and thought and creativity they put into it, because these are a group of kids that don't respond well to homework. So the fact that they had to do that, I was just impressed.
	Lesson implementation	Describes how specific techniques used within the lesson contributed directly to active student engagement	my project broke up the monotony of teacher-centered structure. I entered the classroom with a different approach to teaching, which could have sparked active student engagement simply because it was new.
	Agitation	Participants determine levels of active engagement based on student argumentation, signs of anger, or irritation enacted through relevant lesson-based practices	I feel that several students were angered by the commands that I gave them, which leads me to believe that they were not just doing the work I assigned but questioning what was happening.
	Alertness	Determining the level of student engagement by examining how attentive, excited, or interested students appeared to be during classroom activities	And then as far as watching the video I think that the students seeing their reactions to things if they were facing me and are actually paying attention to me that was one that I looked for,

The student in the front is very excited about the song; he is familiar with the chorus and attempts to sing along. Another student in the background is dancing. |
| | Asking questions | students ask questions to each other or to the teacher to clarify, expand upon, or refute previous statements | To me that was active engagement because they're all trying to get involved and they're all trying to contribute to the end product. And they're asking each other questions and some would answer |
| | Discussion participation | A somewhat generic statement indicating that students' participation in discussions was indicative of active student engagement (but not referring to the amount of participation or comparing the degree of participation with previous discussions) | how much they were participating, yeah, their participation, I've looked for that as something that was more showing of engaged students. |

Category	Indicator	Definition	Examples
Indicators of active engagement	Empathy	Students exhibit insights into lives or perceived feelings of others	then one girl was like "are you trying to show us how all the peasants must have felt?" and I was like "exactly."
	Group collaboration	Determining the extent to which students worked with each other on topic-related activities and relating that to active engagement.	And then I could tell if they were really engaged like mostly when they were working in their small groups I guess. I would go around and they would all be talking about you know how to improve Athens. They all had all these good ideas they were bouncing back and forth. Like that was the most effective way.
	Increased discussion participation	Indicating that more students participated in discussions using this technique than in previous discussions	Also, I felt that more students than usual were involved [in the discussion] and engaged.
	On-task behavior	Generic statement that students exhibit behaviors that demonstrate they are doing what they should be. (This is mostly a miscellaneous indicator). Lowest rung of genericism	C: How did your evidence inform you about the level of active student engagement in the classroom? K: um, well again from the video I could see that students weren't like distracted or doing other things. At least they seem to be paying attention because they're writing notes. Or just like you know listening.
	Respond to peers	Ascertaining students' active engagement by their willingness to verbally respond directly to comments that other students made.	I was encouraged to see this bit of running debate between groups. True, I posed the initial request for rebuttals; the groups carried themselves through it pretty well. I feel that this shows that they understood the material on each subject well enough to analyze what the other group was saying and apply it to their own argument.
	Retention, discussion	Student's verbal responses match with content previously presented in class.	If they come in the next day and have no idea what we talked about yesterday, then I don't really think that they were really thinking about it. But the next day, if they come in and we're doing a quick review or moving on to something else and they are able to make connections and remember what we talked about the day before than I think they are remembering that because they were questioning it.
	Share opinions	Generic statement about students' willingness to share opinions and equating it to active engagement. Above on-task behavior	This is just a small clip of one example that I tried to use to relate the Whiskey Rebellion to present society. Anytime that I ask the students how something might have made them feel, I get more responses than if I just asked them about the term.
	Thoughtful responses, discussion	provides details about the degree to which active student engagement is ascertained from students' thoughtful verbal responses to discussion questions	if I wasn't exactly sure if they were thinking about the material or if they were thinking about something else I would kind of direct a question at them and you and if they said 'well, I think dah dah dah dah dah.' If their answer actually gave any indication of them mulling over what they were going to say, then I attributed that to be active student engagement.

Category	Indicator	Definition	Examples
Indicators of active engagement	Personal Relevance	Assessing active engagement through students' verbal or written responses that include information from their personal lives or content learned outside of class	Um, in another way that I kind of measured success was the fact that they were just getting into some really big issues that I didn't even know they were concerned with. Um and I don't guess there's really a way to measure that but ah, I consider it a success to have them
	Writing quality	Generic responses about being able to decipher active engagement though the quality of student work.	I was also very happy with the quality of writing they students turned in from the activity.
	Writing quantity	The length or number of written responses indicates active engagement	And as far as what they gave me, I...I mean a lot of it was length
	Retention, written	Student's written responses include content previously presented in class (including improved performance).	You know with the work samples I got a glimpse of you know what in the discussion resonated with them and they could translate it over to writing on a test. So what stuck with them
	Thoughtful responses, written	provides details about the degree to which active student engagement was ascertained from thoughtful responses in assigned work	Reading some of the responses the students made to each other's remarks, I cannot help but feel that they were actively engaged in weighing what they thought of each other's comments...The opinions they expressed and the themes they brought up came from really allowing their 'wheels to turn," really thinking about what was written and what they would write.

| Category	Indicator	Definition	Examples
Indicators of passive engagement	Lesson comparison	Participant identifies less active engagement in the current lesson than in previous lessons using the same or similar techniques.	Description: The student doing most of the talking in this group is one of my students that tends to be more involved in class and class discussions. However, even she seemed to struggle with this activity a little. This makes me really think that the activity was not very good about promoting ASE
	Lesson problems	Participant identifies unforeseen problems related to the teacher's lesson implementation, poor lesson planning, or inadequate management is blamed on limiting active engagement in the classroom.	This is another student that is very talkative during a normal class setting. This goes back to the previous problem of not getting enough students involved in the class period. I unwittingly set the debate up this way by having each group choose a group leader that would speak on their behalf. Perhaps next time, I definitely could have arranged it so that more than one person had the opportunity to talk.
	Doing school	Students participate and/or complete assigned tasks but with minimal interest or effort	[Students] definitely can complete the assignment, do what they're supposed to be doing and then they still don't end up getting anything out of it. I've definitely seen that in my classroom already…It's very misleading and you think that they're right on top of it and then you come in and they didn't get what you wanted them to get…but they completed the assignment. So they went through the steps.
	Limited discussion	Students are not verbally participating in discussions but otherwise they appear on-task	I am not sure that there was a whole lot of ASE. My students are all pretty outgoing, but this video only shows a few students participating in the activity.
	Off-task behavior	Students doing things that are unrelated to the lesson.	I look at…students that weren't engaged, like the ones that might have been sleeping or talking to somebody else or working on other schoolwork or something like that.
	Mediocre response	Students provide short and uninsightful verbal responses	However, several students also did the opposite of this. The answers they provided were not as thoughtful and used little information from the previous lessons.
	Mediocre writing	Students provide short and uninsightful written responses	but it seems like the [written] responses were um very short and there wasn't a lot of thought involved because it would be like a sentence or two…I could just tell that they hadn't really thought about it.

Creating your Portfolio

1. Open your web browser and go to **http://www.livetext.com**

2. Enter your username (usually the same as your MyID username) and password in the upper-left portion of the screen and click **Login**.

3. On the main page (pictured at right) click the **Create** button.

4. A new window will appear (pictured below). Choose **Portfolios** under *The University of Georgia* heading from the Choose a Folder list.

5. Select your course template from the Template list.

6. Enter your **"your full name's"** **"name of course template"** for the title (e.g., Craig Shepherd's 06FA-Social Studies Portfolio).

7. Select **Create Document**.

8. Your new document will appear in the LiveText window.

For additional information about LiveText, please visit
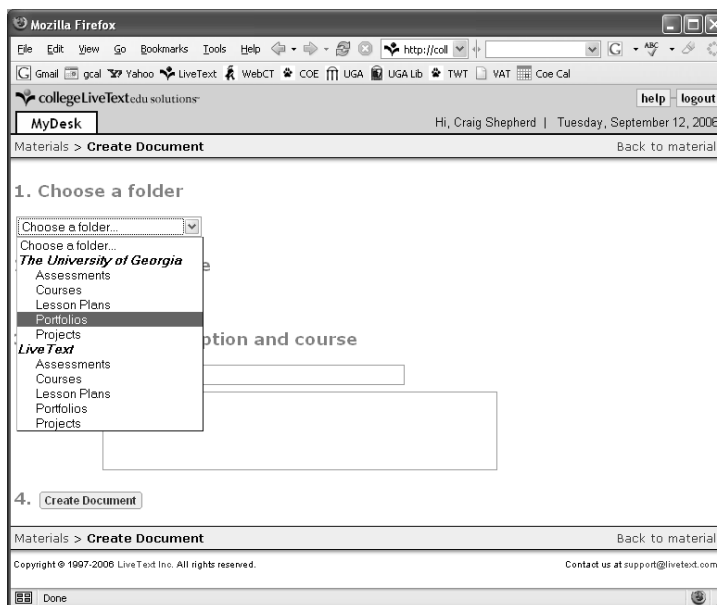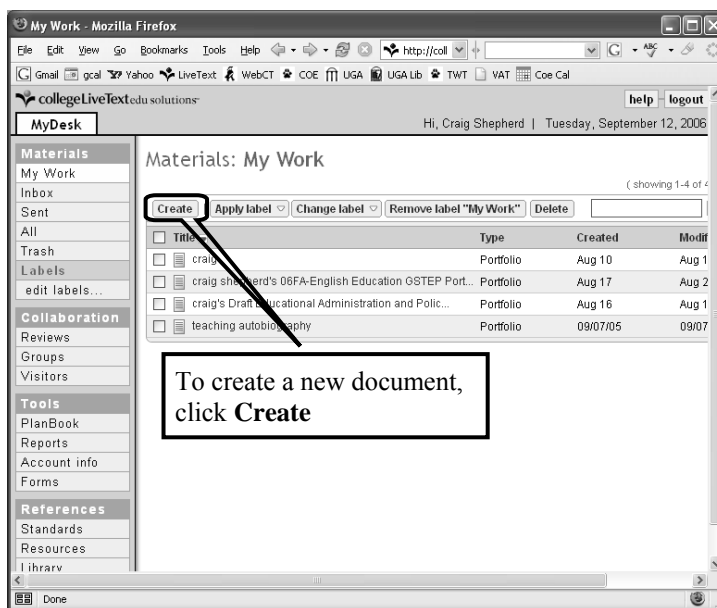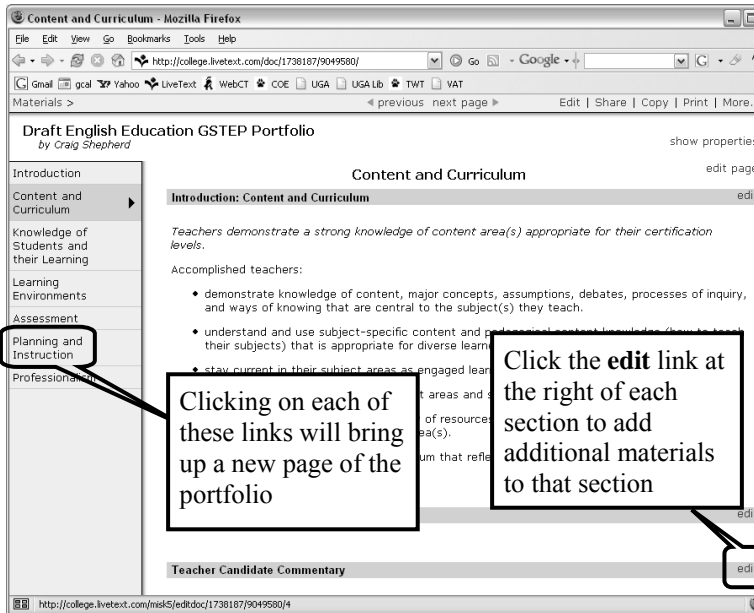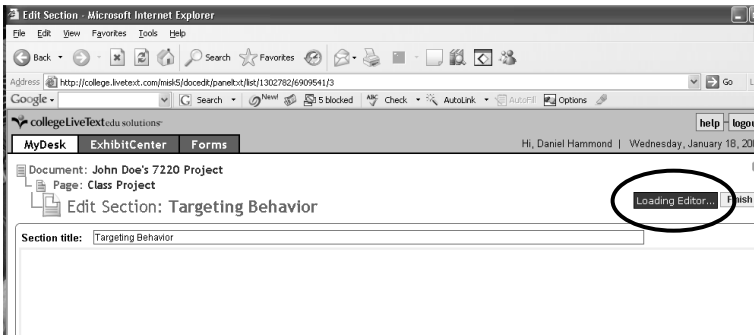
http://www.coe.uga.edu/twt/tutorials/
or call

(706) 583-0409

Editing Your Portfolio

1. Open your web browser and go to **http://www.livetext.com**

2. Enter your username (usually the same as your WebCT username) and password in the upper-left portion of the screen and click **Login**.

3. Click on the link of the document that you would like to edit.

4. Your document will appear. Each link on the left side of the document will bring up a different page in your portfolio. Within each page are different sections.

5. To add content to your portfolio, locate the appropriate section and click the **edit** link on the right side of that section (pictured at right).

6. After clicking the **edit** link, a new page will load with a large text editing window. Notice the red button (circled at right) that says **Loading Editor…** Wait until this button has disappeared (meaning the text editor has completely loaded) before beginning to enter your work.

7. When the editor loads (pictured at right) you will see a space to enter your text. If you pause your mouse pointer on top of any button to see a pop-up description of its purpose. Most of these buttons work like those found in common word processors such as Microsoft Word.

8. To add images or attachments, select the **edit** link at the bottom of your screen that corresponds to the file type you want to upload.

9. Browse for the document on your computer

10. Click on **Attach**

11. Select the **Finish** button.
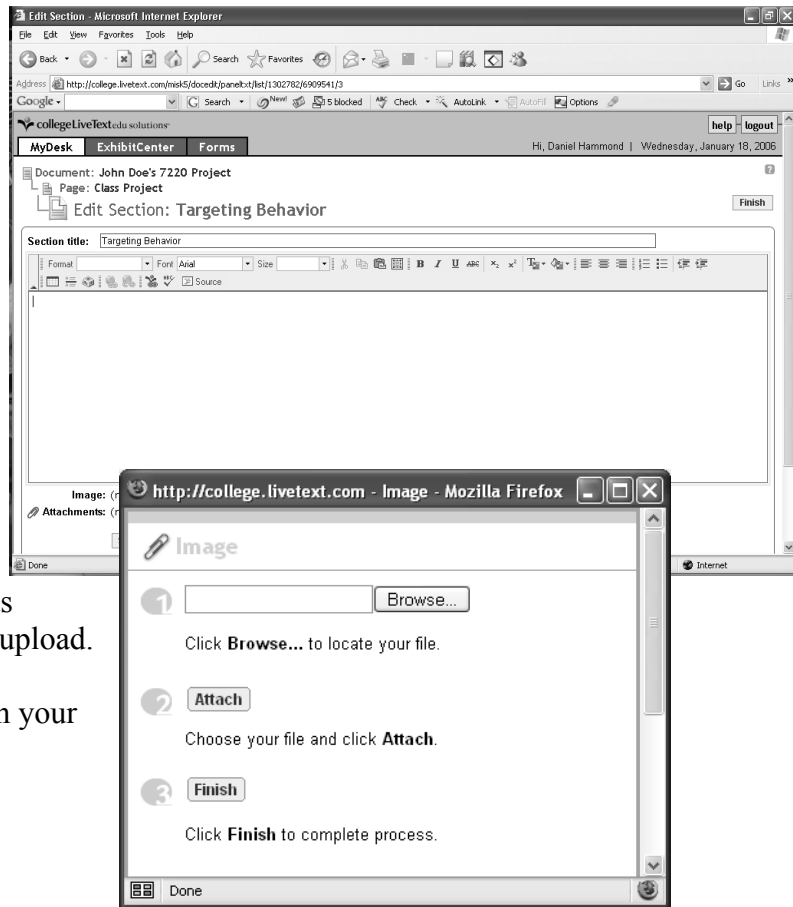
    NOTE: You may only have one image that appears in each section and up to ten attachments per section.

12. Save your work often using the **Save** button at the bottom-left of the screen. When you complete your work, use the **Finish** button to return to your portfolio page.

    *NOTE: Clicking **Finish** does **NOT** submit your work to your instructor; it simply completes an editing session. You may still make changes by following the same steps described above.*

175
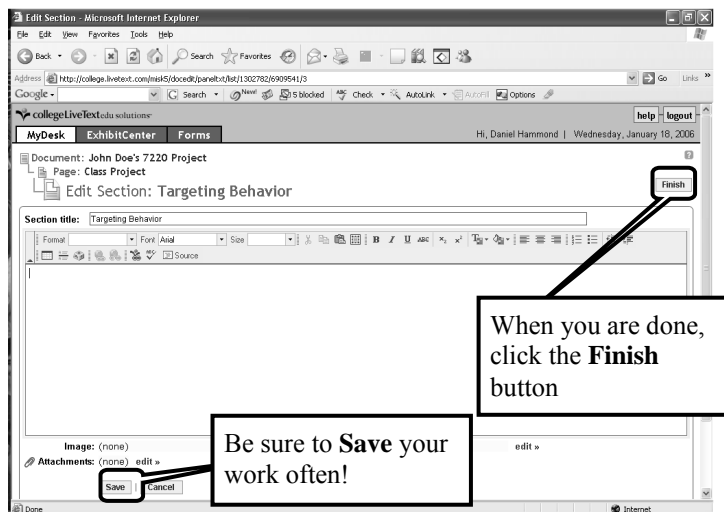
Sharing Your Portfolio for Review

1. Click on the **Submit for Review** link in the upper-right corner of the screen.

2. In the pop-up window type the first and last name of the reviewer. Do not press enter on your keyboard or place a space after the name when you are done

3. LiveText will lookup the name in its database and show a list of users with that name (pictured below).

4. Select the correct username from the list and press the **Enter** key on your keyboard

5. Repeat steps 2-5 to add additional reviewers.

For additional information about LiveText, please visit

http://www.coe.uga.edu/twt/tutorials/
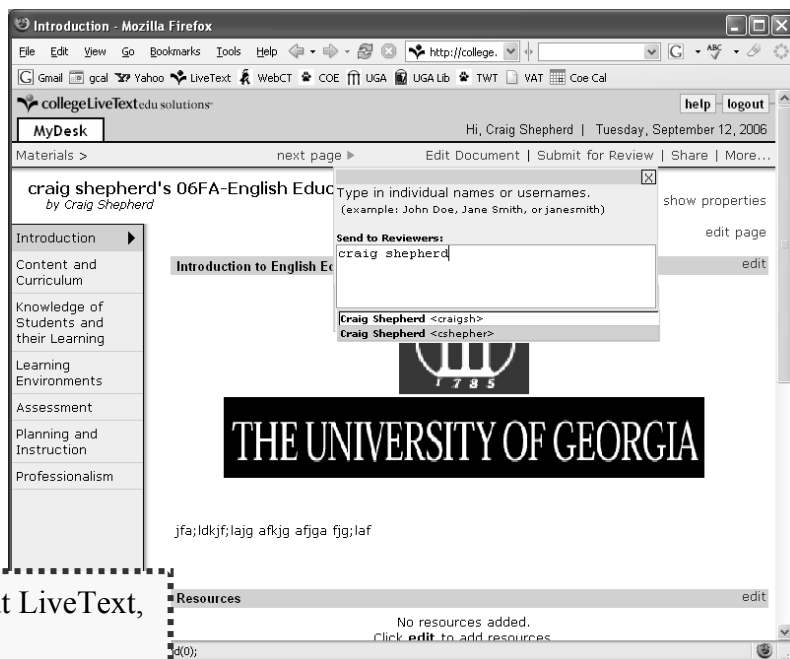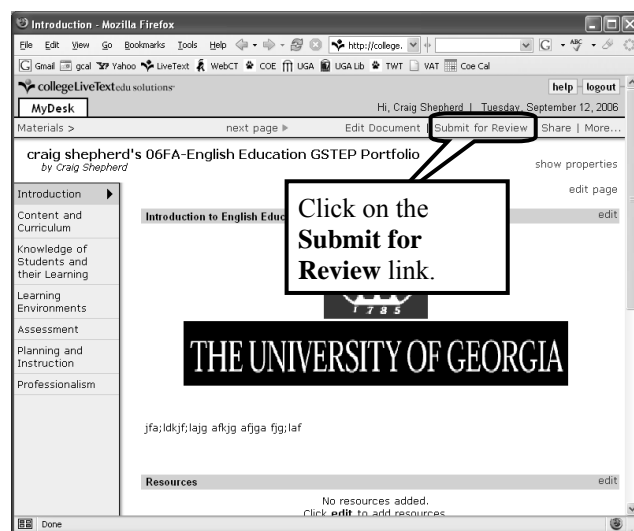
or call

(706) 583-0409

Using the JVC Everio Camera

Be sure this button is placed on the video camera setting

Use this button to delete unwanted video files on the camera

Move this button to record mode ● to begin filming. Move it to play mode ▶ to play back your recordings

Use these buttons to move up, down, left, and right in menu screens and press the middle button to make selections

To transfer files to the computer plug one end of the USB cord here and the other end into the computer

Press this button to start and stop recording your video

Installing PowerDirector Express Software

1. Insert the PowerDirector CD into the computer drive. A copy of this program came with the camera you are using.

2. A setup window should appear, if not navigate to my computer and double click on the CD.

3. Click the **Install** button corresponding to CyberLink DVD Solution (Circled at right).

4. Choose English as the setup language and select OK.

5. Click **Yes** on the Licence Agreement

6. Select **Next** until you get to the Setup Type screen (pictured at right)

7. Select only the CyberLink PowerDirector software (deselect the other two choices) and press Next.

   The software will now install on your computer.
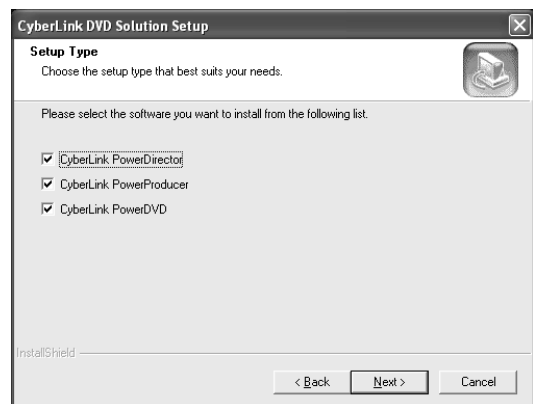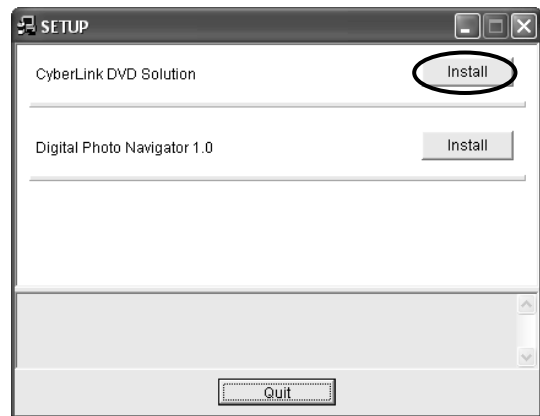
Converting Videos for Placement in VAT

1: Plug your Everio Camera into the computer using the provided USB cord. Also plug your camera into a power outlet.

2: Turn your camera to the play position ▶

3: Open the program **CyberLink PowerDirector Express**.

4: From the program menu, select **File**, place your cursor over **Import**, and select **Media files** (pictured at right).

5: Navigate to **My Computer**. Select the removable disk corresponding to the camera. Open the **SD_Video** folder then the **PRG001** folder. Your clips will be organized chronologically. Select your files and click **Open**. This may take a few minutes.

6: Drag your files to the "Video" row in the order they were captured.

7: Click the "**Produce**" button on the top of the window (circled at right).

8: In the next window select **Create a Streaming File** and click **Next**.

9: Select the **WMV** video format and then choose the **Video for Broadband NTSC (256 Kpbs)** setting from the drop-down list. Click the "**Next**" button.

10: In the **Export File** text field (circled below right), identify the name and output location of the file being created. Then click the **Start** button.

179
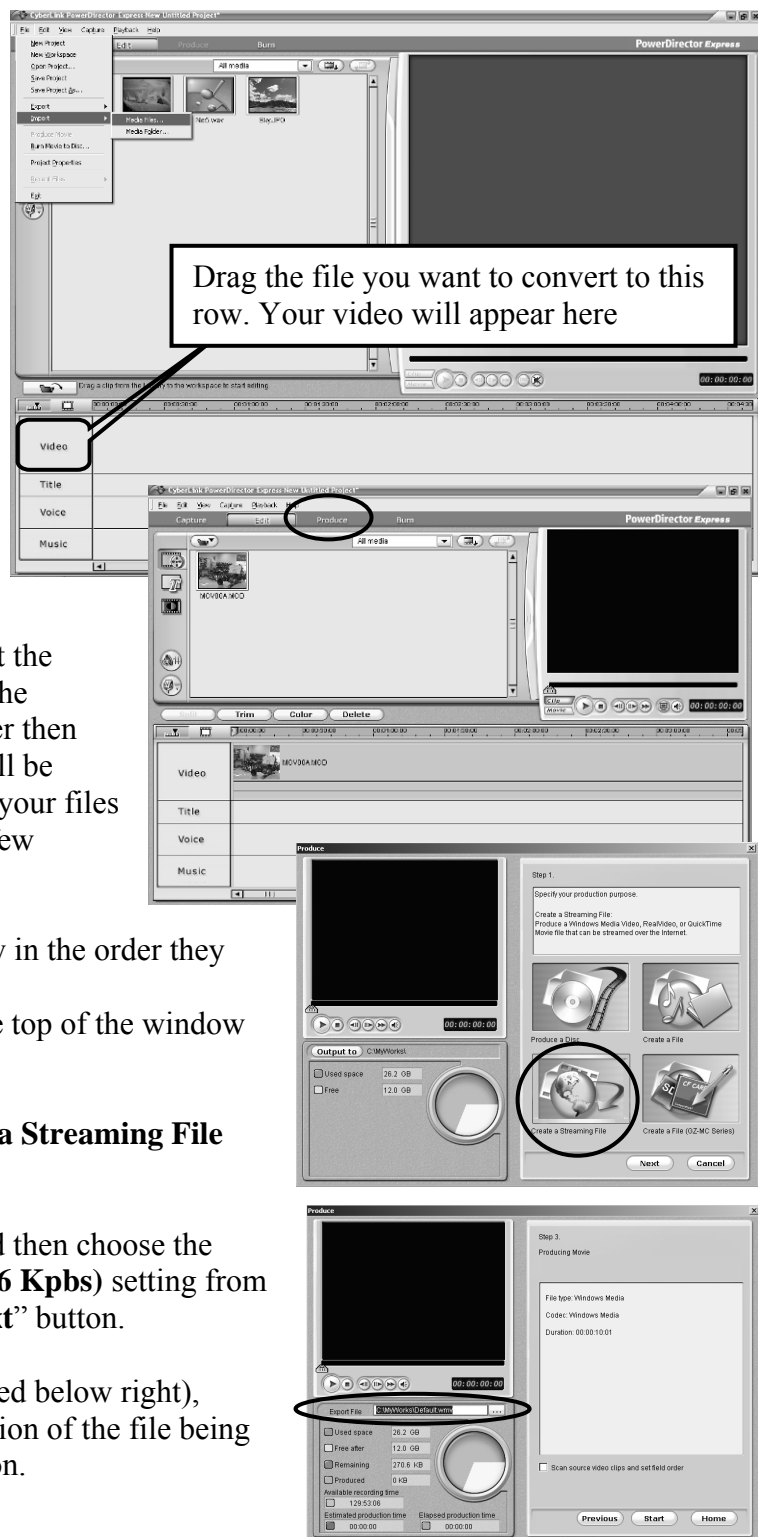
Uploading Videos in VAT

1: Login to VAT (http://vat.uga.edu)

2: To ensure that you have the necessary Internet extensions, click on the "Tester" link on the welcome page (circled at right).

3: Install any extensions (as indicated on the screen)

4: Go back to the welcome screen and click on **My VAT**, select **Manage Files** and **Upload File**.

5: The window (below right) will appear. Make sure the title of your video matches the title in your form (circled).

6: Complete the rest of the form and select **Continue**.

7: Select the **Insert Database Record & Continue to Upload File** button.

8: After the Java applet loads (your browser may prompt you to activate it), locate your file in the left window and select the **>>** button to upload it.
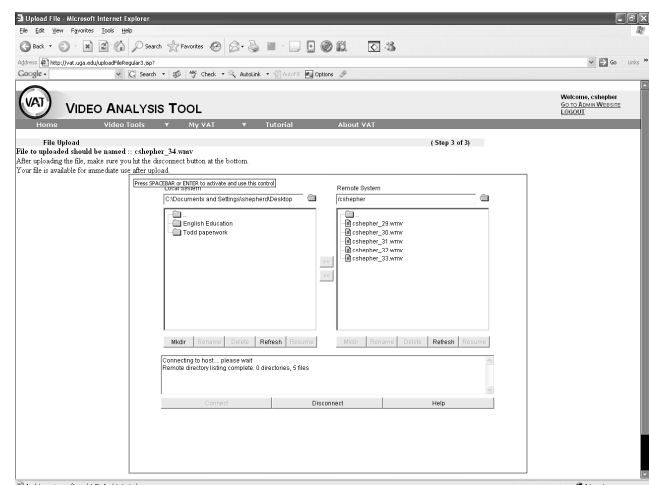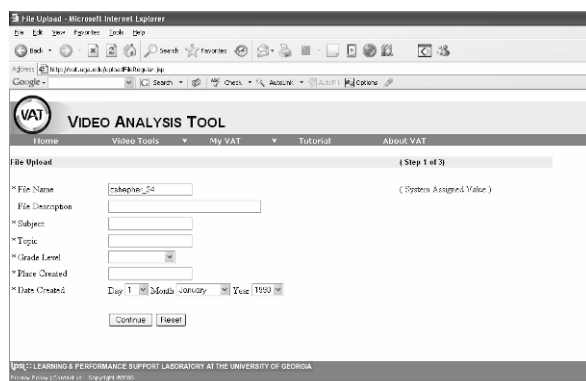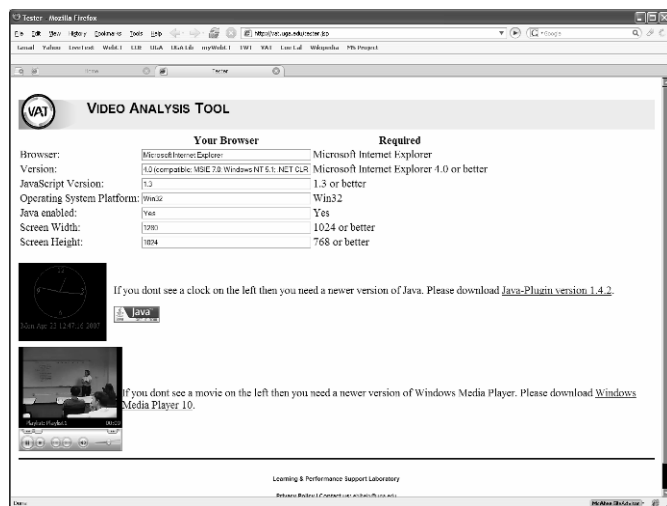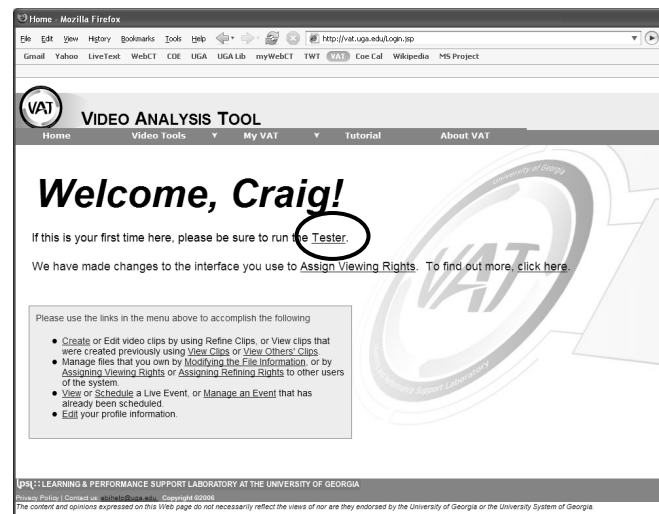
Creating Video Clips in VAT   (*NOTE: This will not work on a Mac*)

1. Open Internet Explorer and go to **http://vat.uga.edu**

2. Enter your username and password.

3. If this is your first time using VAT on your computer, click the **Tester** link and download any plug-ins you need.

4. Click the **Video Tools** menu, place your cursor over **Create Video Clips** and select **Refine Clips**.

5. A list of videos that you may refine will appear (pictured above).

6. Select your video of interest by checking the button located on the left of its file name (circled above).

7. If this is your first time creating clips in this video, select the **ASE-SS** rubric from the **New** column at the right of the screen. If you have already made clips, you must select this rubric from the **Edit** column.

8. Click the **Refine Clips** button. The window pictured at right will appear.

9. Play your video by pressing the ▶ button underneath the blank screen.

10. When you come to a segment of interest, mark it by pressing the **Start Time** button. (use the **<< 10 Sec** and **10 Sec >>** buttons to quickly locate the beginning of the segment).

11. Press the **End Time** button when the segment of interest concludes.

12. Use the comments section to write your rationale for creating this clip. Then fill out the questions in the rubric. When you are done making comments, press the **Send Clip to Bin** button.

13. Continue making clips by repeating steps 10-13.

14. To save your clips and finish your work, press the **Submit** button at the bottom-right of your screen (you may have to scroll down to see this button.
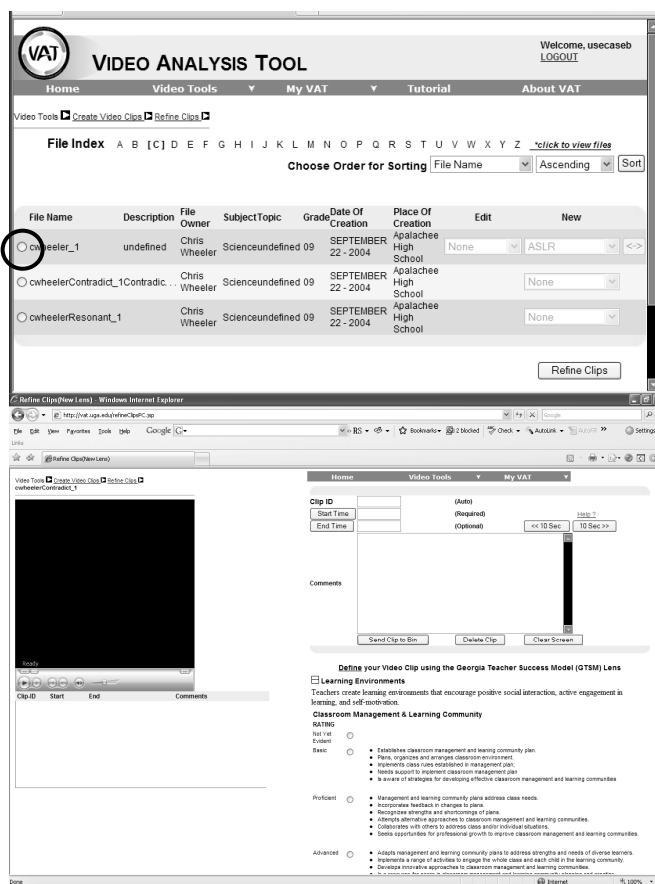
Viewing Video Clips in VAT

1. Open Internet Explorer on a computer running Microsoft Windows and go to http://vat.uga.edu

2. Enter your username and password.

3. If this is your first time using VAT on your computer, click the tester link and download any plug-ins you need

   NOTE: There are two ways to view videos in VAT. You may view your annotations alone or you may compare your annotations side by side with those of others. This guide will describe how to view videos using each of these methods.

Viewing Your Clips

1. Click the **Video Tools** menu, place your cursor over **Create Video Clips** and select **View My Clips**.

2. A list of your videos will appear. Select the video that you are interested in by checking the button to the left of its file name.

3. Press the **View Clips** button.

4. A window will appear with your annotations (see picture at right).

5. To view the video for each annotation, click on the button under the Start column.
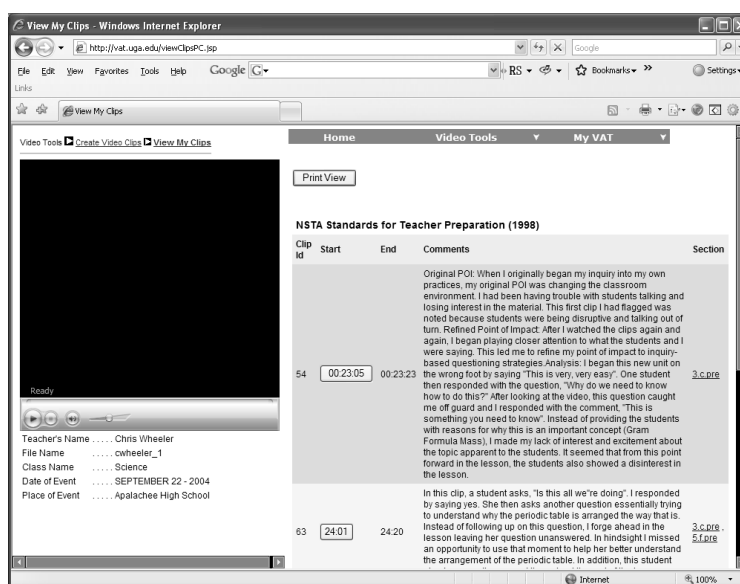
Viewing Others' or Comparing Clips

1. Click the **Video Tools** menu, place your cursor over **Create Video Clips** and select **View Others' Clips**.

2. A list of your videos will appear. Select the videos (up to two) that you are interested in viewing by checking the button to the left of their file names.

3. Press the **View Clips** button.

4. A window will appear with these videos and annotations.

5. To view video for each annotation, click the button under the Start column.

   *NOTE: To copy video annotations for portfolio purposes, highlight the table of annotations with your cursor, press your right mouse button and select **Copy** from the list of choices. Then locate the portion of your portfolio where you want the table (be sure to edit that section) and press your right mouse button again. Choose the **Paste** option from the list. The table will appear in your portfolio.*

Sharing Video Clips in VAT

1. Open Internet Explorer on a computer running Microsoft Windows and login to **http://vat.uga.edu**

2. If this is your first time using VAT, click the **Tester** link and download any plug-ins you need.

   NOTE: There are two ways to share videos in VAT. By granting users refining rights you give them permission to annotate your video. By granting users viewing rights, you give them permission to view your annotations. You may want to grant certain users both refining and viewing rights because those users with refining rights cannot view your annotations unless you provide them viewing rights.

Assign Refining Rights

1. To grant users refining rights, click on the **My VAT** menu, place your cursor over **Manage Files** and select **Assign Refining Rights**.

2. A screen will appear listing all videos that you can assign refining rights to. Select the video of interest from this screen (by clicking the button to the left of its file name) and click the **View/Modify Access List** button. The window (pictured at right) will appear.

3. Select a user from the *No Access List* on the right of the screen and click on the **<< Grant** button. Repeat this step to add additional users to the *Access List*.
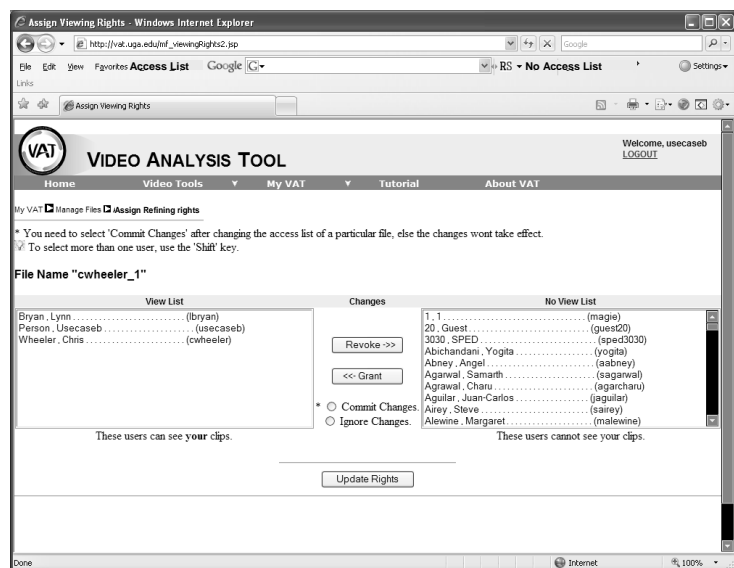
4. Click the **Commit Changes** button and press the **Update Rights** button. Those users you selected may now annotate your clips but will be unable to view your annotations unless you give them viewing rights.

Assign Viewing Rights

1. To grant users refining rights, click on the **My VAT** menu, place your cursor over **Manage Files** and select **Assign Viewing Rights**.

2. A screen will appear listing all videos that you can assign viewing rights to. Select the video of interest from this screen (by clicking the button to the left of its file name) and click the **View Existing Rights** button.

3. The window (similar to the one pictured above) will appear.

4. Select a user from the *No View List* on the right of the screen and click on the **<< Grant** button. Repeat this step to add additional users to the *View List*.

5. Click the **Commit Changes** button and press the **Update Rights** button. The users you selected can view your clips but will be unable to make their own annotations unless given refining rights.

APPENDIX S. DEMOGRAPHICS QUESTIONNAIRE

1. Name: _____

2. Email address: _____

3. Are you currently employed as a teacher within the state of Georgia?   Yes   No

    a. If you answered "Yes" to question 3, what grade level do you teach? _____
    b. What school are you currently employed at? _____

4. Please indicate how many years experience you have in the following areas:
    a. Primary teacher in K12 classroom: _____
    b. Substitute Teacher in K12 classroom: _____
    c. Paraprofessional in K12 classroom: _____
    d. Working with students with special needs: _____
    e. Working with diverse student populations: _____

5. Have you completed EDIT 2000 prior to this course?   Yes   No

6. Have you ever made a portfolio before   Yes   No

7. If you answered Yes, please describe when and what you did:

8. Have you ever participated in reflective practices for teacher development?   Yes   No

9. If you answered "Yes," please describe when and what you did:

Use the following scale for questions 10 and 11:
1 = Very comfortable, 2 = Somewhat comfortable, 3 = Unsure, 4 = Somewhat uncomfortable,
5 = Very uncomfortable

10. What is your overall comfort level using a computer?

11. Indicate your familiarity with the following technologies:

	1	2	3	4	5
Navigating the Internet					
Using digital video camera					
Using a scanner					
Taking digital still pictures					
Sending email attachments					
Using LiveText					
Using other portfolio software					
Using the Video Analysis Tool					
Constructing a teaching portfolio					