The effect of computer-mediated video on lesson analysis skills gained in early music education field experiences

by

Kevin T. Shorner-Johnson

(Under the direction of Mary Leglar)

Abstract

The purpose of the study was to examine the effect of computer-mediated video observations on the development of teaching-analysis skills in preservice teachers. The following questions guided the study: 1) Are live-classroom or computer-mediated observations more effective in developing critical analysis skills? 2) Does student background, gender, or experience with technology have a discernable effect? 3) What are the qualitative differences, identified by the subjects, between live and virtual observations? 4) What improvements in the researcher-designed computer program were indicated?

A pretest, posttest design was used. Subjects were enrolled in three intact classes of college students: one class of music majors in a Foundations of Education class, and two separate classes of early childhood majors in music methods classes. Eight treatment periods were used with each group. Using various delivery systems, all subjects were asked to observe and analyze the same lessons: music majors observed in a live-classroom or an online computer-mediated situation; one class of early childhood majors also observed via an online computer-mediated video; and the second class of early childhood majors used projected video. Subjects analyzed the observations using a researcher-developed observation rubric.

Findings revealed no significant differences between groups on the pretest or posttest measures. However, effect size estimation and an analysis of a question subset revealed differences between the early childhood groups. Self-reported data on satisfaction, impact on knowledge, advantages/disadvantages, discourse analysis, and analysis of time revealed important contextual information about the strengths and weaknesses of approaches to field experience.

INDEX WORDS: Music education, Field experience, Digital video, Teacher preparation, Video, Practicum, Computer-mediated, Online video

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Dedication

This work is dedicated to my wonderful family: my parents who encouraged and guided me throughout my education and growth as an individual, my sister who has provided me with the wonderful companionship and support, and my wonderful wife, Amy, for her encouragement, support, and love. Her encouragement and support has made the rough places easier and the summits higher.

Finally, I would like to make a special acknowledgement to my nephews and my extended family of the Shorners. The second chapter of this dissertation is dedicated to Dylan Tuck. As most of this chapter was written in Dylan's hospital room, I can't think of a more fitting dedication. The chapter is dedicated to Dylan and children everywhere who deal with seizures and Sturge-Weber syndrome.

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Chapter 1

Introduction

Traditionally, the teacher education curriculum has been perceived as having two components: theory (content knowledge) and practice (instructional delivery). The application of theory to practice has proven to be the most problematic link in the training of prospective teachers. The primary vehicle for achieving this transition has been the use of various types of apprenticeships, ranging from early field experiences to student teaching.

Field experiences are embedded in the history of American teacher education. The birth of the normal schools in the 19th century initiated the practice as a critical component of teacher education. Advocates emphasized the importance of field experience by drawing comparisons between medical and teacher education. Just as medical students needed surgical experience in addition to a knowledge of anatomy, so prospective teachers required actual classroom experiences in addition to pedagogical and subject knowledge. Without these experiences they were believed to be fundamentally disadvantaged (Fraser, 2007).

Field experience persisted as an important factor in teacher education through the progressive education movement of the early 20th century (Borrowman, 1965; Dewey, 1903), and it remains a fundamental part of certified teacher education programs today (Association of Teacher Educators, 2000; NCATE, 2006). The National Council for the Accreditation of Teacher Education (NCATE) advocates that colleges of education and their school partners "design, implement, and evaluate field experiences and clinical practice so that teacher candidates and other school personnel develop and demonstrate the knowledge, skills, and dispositions necessary to help all students learn" (p. 28).

While clinical experiences have received near-universal support as a means of embedding teacher education knowledge in context, the results of research studies on their efficacy have been mixed. Though field experiences usually have an impact, little is known about what the impact is or the quality of that impact (Clift & Brady, 2005; Guyton & McIntyre, 1990). Several studies have found that participation in field experiences develop teacher performance (Sunal, 1980), competence (Allison, 1987; Darling, 1988; Grossman, 1991; Kagan, 1992), and motivation (Van Zoest, 1995). However, problems have also been identified. For example, field experiences often contradict the attempts of teacher educators to improve and reform instruction with each successive generation of teachers. College students who have learned progressive pedagogical theories in their teacher education classes are confused by the lack of effect such theoretical knowledge has on the actual practice of teaching. This confusion often leads prospective teachers to give up their new pedagogical knowledge and continue the status quo (Goodlad, 1990; Grossman, 1991; Wragg, 1987; Zeichner & Tabachnick, 1981).

Teacher education institutions seeking to provide field experiences encounter practical problems as well. Careful placement of students in public schools consumes considerable faculty time, as does adequate supervision of the field experiences; this investment of time and resources may take time away from student instruction at the university (Leglar, 1988). In addition, it is often difficult to find enough diverse placements and ones that offer exemplary instructional quality within a reasonable geographic radius of the home institution (Leglar, 1988; Simpson, 2006).

Even when scheduling and supervision are satisfactory, students who participate in field experiences face problems of observation, perception, and attention. Students in an observation environment encounter a multitude of stimuli within a school classroom (Kagan & Tippings, 1992). Overwhelmed, they tend to experience a great deal of difficulty in prioritizing information, viewing from a detached perspective, organizing information, and forming inferences about what is observed (Berliner, 1986; Carter, 1987; Carter et al., 1988; Carter, 1994; Sherin, 2001; Standley & Madsen, 1991). Stephens (2004) wrote, "live observations, despite

their undisputed value, do not always provide novice and preservice teachers opportunities for focused critical analysis and deep reflection because the moment observed disappears as it happens" (p. 76).

In view of the limitations described above, the Association of Teacher Educators (2000) stated that field experiences as they are currently structured do not reinforce what has been learned in the college classroom, fail to provide a diverse array of experiences, and do not offer adequate opportunities for analysis and reflection on the experience. Simply providing field experiences does not automatically ensure a meaningful learning experience. To enable students to engage in focused critical analysis of field experiences, teacher education practitioners and researchers have turned to various methods and tools to facilitate lesson analysis.

One of the most prominent tools is video, which offers the ability to isolate focus points, repeat viewing, capture contextual information, view across geographic and temporal boundaries, and facilitate reflective processes (Brame, 2004; Kagan & Tippings, 1992; Kinnear, McWilliams, & Caul, 2002; Leglar, 1992; Merkley & Hoy, 1985; Sherin, 2004; Wang & Hartley, 2003; Wragg, 1987). The development of multimedia technology and the more recent integration of digital video technology with metadata have opened up new possibilities for improving the quality of field observations. Combining video stimuli, instruction, user responses, and feedback in a single environment can both encourage reflection and resolve conflicts between what is learned in the college classroom and what is observed in the school classroom.

1.1 Purpose of the Study

The purpose of this study was to compare the effectiveness of computer-mediated video, projected video, and live observation on the lesson analysis skills gained in early music education field experiences. A secondary purpose was to examine the effect of student experience, gender, and technology background, on live, group, or computer-mediated observation. The research questions of this study were:

1. What is the effect of computer-mediated video, projected video, or live experience on the development of lesson analysis skills in early music education field experiences?
2. What effects do student background, gender, and technology experience have on computer-mediated, projected video, or live observation?
3. What are the qualitative differences between students' live and virtual observation experiences?
4. How can the developed tool be improved to optimize student field experiences?

1.2 Rationale

Researchers have determined that there is a strong need for further field experience research in how these experiences can be most effectively structured and how tools can be used to optimize these experiences (Clift & Brady, 2005; Guyton & McIntyre, 1990). Guyton and McIntyre (1990) wrote:

> Despite the overwhelming positive feeling about the efficacy of field experiences, there does not exist enough data to determine that extending field experiences, whether at the early field experience or student teaching stage, will develop more effective thoughtful teachers than those prepared in shorter field experience programs. Although there remains a great need for additional research in this area it appears that *what occurs* during field experience is more important than the *length* of the experience. (p. 176, emphasis added)

Three studies have investigated differences between live experience and video-mediated experience. The findings vary: Winitzky and Arends (1991) found no difference between live and video-based observation, while Eckrich et al. (1994) and Kagan and Tippings (1992) reported a difference in favor of subjects who used video-mediated observation. Based upon these initial research studies, the effectiveness and optimal structure of video-mediated observation remains to be determined.

1.3 Design of the study

This study implemented a pretest-posttest control-experimental group design across two parallel studies. One study compared the effect of treatment condition on music majors' lesson analysis skills and the second compared effects on early childhood major lesson analysis skills. The between-groups factor in the Music Major Study was the use of computer-mediated or live field experiences. The between-groups factor in the Early Childhood Study was the use of computer-mediated or projected video field experiences. Subjects in both studies completed a pretest and posttest measure using a Multi-State Observation Form developed for the study in the control treatment environment. (Appendix E).

The Multi-State Observation Instrument was constructed based upon an analysis of teacher performance standards collected from all state departments of education in the United States of America where such a document existed. Observation forms were entered into an online reviewing system, coded, and reviewed by a panel of public school practitioners, graduate students, and college faculty. Pervasive elements in teacher performance standards were coded, defined, and used to develop representative questions for the Multi-State Observation Instrument.

In the Music Major Study, experimental group participants engaged in eight observations using a computer-mediated observation tool and two observations in the live observation environment (pretest and posttest). A video camera was placed in each of the control group's observations such that the camera captured video from the same perspective and placement as the control group students. Video was collected and then coded for experimental group use the following week. The computer-mediated program was structured with the same standardized observation instrument, but included abilities to pause, rewind, fast-forward, mark using video time codes, and receive feedback on the accuracy of event identification (Appendix C).

Control and experimental subjects were measured using the completion of the standardized observation form in the context of a live observation. Data obtained from student

observations were analyzed for both accuracy and quality of response. Accuracy of responses were measured by comparing student responses to the completion of the same form by three experienced music educators.

1.4 Organization of the study

This chapter examined problems inherent in field experiences and has proposed a research agenda to examine the effect of a tool developed for field observations. Chapter two will present the history, problems, and strengths of field experience; research on observation perception and attention; and research on the development of tools to assist teacher education. Chapter three will describe the methodology of the study in detail. Finally, chapter four and five will present the results and the conclusions of the study.

Chapter 2

Related Literature

One of the primary aims of education is transfer. If schooling is effective, the student should transfer the knowledge that is learned in the classroom to a given context. Ausubel, Novak, and Hanesian (1978) stated, "past experience influences, or has a positive or negative effect on, new meaningful learning . . . If this is true, all meaningful learning necessarily involves transfer" (p. 165). In a similar manner, the aim of meaningful teacher education is to prepare the preservice teacher with knowledge that is capable of being transferred to the context and practice of classroom teaching. Carter and Gonzalez (1993) stated:

> If novice teachers' knowledge is not functionally related to the tasks of teaching in classrooms, it is highly unlikely that they will become self-regulatory in the face of natural problems in classroom life; and their way of understanding events may prevent them from learning more about teaching with additional experience. (p. 231)

In response to the need to connect pedagogical knowledge to the context of schooling, teacher education has developed numerous experienced-based courses known under diverse titles such as classroom observations, field experiences, student teaching, and practica.

While the use of field-based experiences has been widely adopted by teacher education institutions and accrediting agencies, many caution that field experience quantity is not a substitute for field experience quality. Within a given environment, research in observations has found that wide variances exist in what individuals see. Simply placing an individual in a given context does not ensure that the individual will see that which is intended.

In response, professional organizations have called for the development of structures, tools, and methods of analysis that will aid the preservice student in transforming field experiences into meaningful learning experiences. The Association of Teacher Educators (2000) and the National Council for the Accreditation of Teacher Education (2006) have called for more deliberative field experiences with more opportunities for reflection and analysis. Effective teacher education with strong field experiences "needs to move preservice teachers to higher conceptual levels, more complex thinking about teaching, and influence teachers to make connections between their lives in classrooms and what is being learned" (Association of Teacher Educators, 2000, p. 9). This chapter will review the history, strengths, and problems of field experience, research on variables that affect observations, lesson analysis structures, and further structures and tools that aid in situating teaching knowledge in context.

2.1 Field Experience

Teacher education has long valued field experiences as a way to situate knowledge about teaching in context. The birth of normal schools in the United States came with an emphasis on preservice teacher field experiences. At the opening of the second normal school in 1839, Massachusetts governor Edward Everett said that the normal school was a school of practice in which "the young teacher may have the benefit of actual exercise in the business of instruction" (Fraser, 2007, p. 124). In the 1870s, the New York State Legislative Committee commented that:

> Usually near the close of the day, these pupils who have been acting as teachers, as well as those who have been "observing" ... [meet with a supervisor] pointing out and explaining not only the errors, but the excellencies observed ... The committee were very deeply impressed with the great value of the exercise. (p. 123)

The idea of field experiences in education was often justified by drawing comparisons between teacher education and medical education. Advocates argued that medical graduates without actual experience in surgery would be a danger to the profession. As such, teachers would also be a danger to the profession without practical and situated classroom knowledge.

The era of progressive education at the beginning of the twentieth century further reinforced field experience education with its approach rooted in the philosophical ideas of pragmatism. John Dewey laid out a model of teacher education in which observation was a key component. Dewey (1903) stated:

> At first, the practice school would be used mainly for purposes of observation. This observation, moreover, would not be for the sake of seeing how good teachers teach, or for getting 'points' which may be employed in one's own teaching, but to get material for psychological observation and reflection, and some conception of the education movement of the school as a whole. (p. 26)

The experiential quality of field experiences reinforced a teacher's knowledge and use of teaching strategies.

In 1946, the Commission on Teacher Education summarized its findings on field experience after a review of large research reports on teacher education. In a new progressive teacher preparation project "prospective teachers were enabled to begin observation of children relatively early in their preparatory careers, and opportunities were provided whereby they might work with young people responsibly and under guidance in varied school and other situations" (Borrowman 1965, p. 240). Experiences were designed to check student potential, allow students to connect "theoretical formulations" to the context of teaching, prevent students from becoming 'mechanical' teachers, and to develop teacher confidence and security.

Calls for the reform of education following the 1957 Sputnik launch brought reforms in teacher education and the development of microteaching as a new form of field experience. Microteaching was born at Stanford University out of student frustration with the

inability of teacher education to perceivably have an impact on the individual. Microteaching is defined as "a laboratory training procedure aimed at simplifying the complexities of regular teaching-learning processes" (Perlberg, 1987, p. 715). The program involved "scaled down" and "focused" teaching in which the teacher focused on the development of specific skills.

Most recently, the importance of field experience and its place within teacher education has found strong support within the professional organizations of the American Association of Teacher Educators (2000) and the National Council for the Accreditation of Teacher Education (NCATE) (2006). In defining the standards for teacher preparation programs, NCATE stated that "the unit and its school partners design, implement, and evaluate field experiences and clinical practice so that teacher candidates and other school personnel develop and demonstrate the knowledge, skills, and dispositions necessary to help all students learn" (p. 25).

Prominent individuals have also emphasized the importance of contextual experience within teacher education (Berliner, 1985; Boardman, 1992; Darling-Hammond, 1999; Shulman, 1986). In an address to the American Educational Research Association National Conference, Shulman (1986) advocated situating teacher education propositions in rich contexts, therefore placing preservice students with some of the same complex decisions that professionals face. "Extended clinical experiences which are carefully chosen to support" the aims of education is advocated as a characteristic of successful teacher education programs, according to Darling-Hammond (1999, p. 234). Boardman (1992) wrote that field experiences form an important component of the "outward-inward-outward-inward" reflective learning process in music education.

Researchers claimed that field experiences develop teacher performance (Sunal, 1980), competence (Allison, 1987; Darling, 1988; Grossman, 1991; Kagan, 1992), and motivation (Van Zoest, 1995). Sunal (1980) found that students with 30 hours of field experience had significantly ($p<.05$) higher scores on microteaching performance than students with less

experience. Researchers in the development of preservice competence have claimed that field experience helps students to situate course concepts (Allison, 1987; Darling, 1998), develop theoretical vocabulary about teaching (Grossman, 1991), and develop classroom problem solving skills (Kagan, 1992).

The strength of curricular field experience has been reinforced by the belief of preservice students that field experiences are the most important component of practitioner education (Baker, 2005; Browne-Ferrigno, 2003; Darling, 1998; Johnston, 1994). Participants in a literacy education program stated that field experiences and multimedia case-based instruction were the primary contributors to their growth as teachers (Baker, 2005). Johnston (1994) wrote that students perceive the importance of field experiences through a "banking" metaphor. As students gain experience, they deposit that experience into their "bank account." With each "deposit," preservice teachers believe that they automatically become better teachers.

While school experiences have strengths that allow preservice teachers to place knowledge in context, field experiences also have problems and challenges. Problems of field experience include its often contradictory nature, conflicting roles, emphasis on classroom management, artificial nature, lack of observable depth, and geographic and supervision problems. Researchers cited that field experiences often contradict teacher education (Association of Teacher Educators, 2000; Feiman-Nemser & Buchmann, 1983; Kagan, 1992) and act as a conservative force that reinforces the status quo (Calderhead, 1988; Goodlad, 1991; Grossman, 1991; Wragg, 1987; Zeichner & Tabachnick, 1981).

Disconnects between teacher education coursework and field experiences prevent students from receiving adequate knowledge of teaching and the analysis of teaching. Feiman-Nemser and Buchmann (1983) spoke of a "two-world" disconnect between schools and colleges that does not adequately assist students "in seeing how understanding can clarify and shape ways of doing" (p. 17). After a review of 40 studies, Kagan asserted, "the practica entailed in programs are generally inadequate in length and number and stand apart from the content

of course work; information presented in courses is rarely connected to candidates experiences in classrooms" (p. 154).

Researchers cited that tensions between teacher education and public education form a struggle between liberal and conservative forces in which the conservative forces most often prevail. A description of an English education course revealed that a progressive course in teaching well-sequenced writing with integrated formative assessment was met with resistance at the commencement of field experiences. In this case, field experiences encouraged students to throw away their new knowledge about literacy instruction so that they could conform to the demands of their cooperating teacher (Grossman, 1991).

Zeichner and Tabachnik (1981) classified these differences as one of three possible conservative-reinforcing scenarios. Students are either taught in a liberal college that is followed by a conservative field experience, retain their conservative beliefs throughout teacher education and reinforce them in field experience, or learn from the conservative forces of both teacher education and field experience. In all three scenarios, a conservative force prevails to maintain the status quo in teaching. Field experience as it is practiced may hurt rather than help the development of teachers.

"Liberal" teacher education knowledge is often rejected by students and schools because it is seen as being unrealistic and idealistic. Schoolteachers often believe that college professors are so far removed from "real experience" that preservice education falls short of meeting a reality check. Calderhead (1988) stated that the work of college supervisors is relegated to that of administering a driving test. Preservice teachers go through the motions needed to pass the test and then return to a more traditional conservative style of teaching once the 'drivers ed' instructor has left.

These problems and disconnects often arise because the supervising public school teacher becomes the dominant influence upon students regardless of quality or ability to develop teachers (Berliner, 1986; Kagan, 1992; Moore, 2003). In an analysis of the interactions between preservice teachers and cooperating teachers, Moore (2003) noticed that preservice

teachers "often adopted the style and method expressed by the mentor teacher regardless of whether they were in conflict with theory or practice suggested in the university classroom" (p. 40). Often the knowledge embodied within the expert teacher is difficult for the preservice teacher to acquire. Berliner (1986) wrote, "a fundamental problem in apprenticeship programs is that experienced and expert practitioners very often lack the ability to articulate the basis for their expertise and skill" (p. 7).

The dominance of the cooperating teacher and the perception of collegiate aloofness emphasizes the complexity of role relationships around student teaching. College supervisors, preservice teachers, cooperating school teachers, and cooperating principals all bring different and often conflicting role conceptions to the planning and implementation of field experiences (Calderhead, 1988; Clift & Brady, 2005; Feiman-Nemser & Buchmann, 1983; Guyton & McIntyre, 1990). Feiman-Nemser and Buchmann (1983) referred to the conflicting role relationships as the "cross-purposes pitfall."

Calderhead (1988) followed 10 students through a one-year training course for middle grades education in northern England. Qualitative data from observations, interviews, and documentations of conferences revealed that headteachers (principals), supervising teachers, tutors (college supervisors), and students brought different role expectations to their work. Headteachers, supervising teachers, and tutors saw preservice teachers as "an extra pair of hands" (view of principals), individuals who provided companionship and just needed to be "thrown into the deep end" (cooperating teachers), and individuals who needed continuous reflection for growth (college supervisors). The preservice students in the middle of these diverse role expectations were often highly stressed and focused mostly on classroom management.

The focus on classroom management has been widely documented as the primary concern of preservice students as they encounter their first "survival" experiences in the education classroom (Calderhead, 1988; Carter, 1994; Kagan, 1992; Moore, 2003). The reality of routine problems and classroom management problems makes students more authoritarian and

custodial at the expense of what they learned in teacher education programs. Preservice teachers fail to focus on student learning and instruction until they are confident with classroom procedures (Kagan, 1992). Students who observe instruction often focus on classroom management concerns over other aspects of classroom instruction (Carter, 1994).

The classroom placement is often perceived by the preservice teacher to be an "artificial" experience (Johnston, 1994; Simpson, 2006; Stephens, 2004). Johnston (1994) wrote that:

> Students perceived the artificial nature of student teaching. They did not see much of the time they spent in the classroom, observing teaching, interacting with children, preparing and implementing lessons as part of the learning process because it did not conform with their own images of what teaching should be like. (p. 204)

As real or artificial as these experiences are, the ongoing nature of the complex teaching act may not be the most meaningful experience for preservice education. Stephens (2004) wrote that "live observations despite their undisputed value, do not always provide novice and preservice teachers opportunities for focused critical analysis and deep reflection because the moment observed disappears as it happens" (p. 76).

Many also have cited that classroom observations are a limited view and therefore artificial view of teaching and learning (Muijs, 2006; Perry & Power, 2004; Stodolsky, 1984; Taebel, 1992). Field experiences often focus only on the observable behaviors that students see within a brief time span. Students never have an opportunity to understand the many contextual factors behind actions (Perry & Power, 2004). Stodolsky (1984) wrote that the one-shot observation had problems of observer and context reliability. Teachers' variety of teaching styles used was dependent upon the content taught and classroom situations that were encountered. Within fleeting observations, "all classroom observations are by definition snapshots, and even successive observation of a teacher will only ever supply a collection of snapshots rather than a full picture of said teacher's behaviour over the year" (Muijs, 2006, p. 58).

Other concerns of field experience have included problems of geography and supervision (Leglar, 1988; Simpson, 2006). Leglar (1988) wrote that music education departments cannot afford to allocate sufficient faculty time for field supervision. Additionally, it is often difficult to find enough master teachers and qualified supervisors, suitable public school programs, and diverse cultural placements (Leglar, 1988; Simpson, 2006).

Writers of meta-analysis reviews have claimed that the variables of field experience are too often "black-boxed" or lumped together (Guyton & McIntyre, 1990) and that more emphasis needs to be placed on obtaining information on how field experiences should be structured (Association of Teacher Educators, 2000; Berliner, 1985; Clift & Brady, 2005; National Council for the Accreditation of Teacher Education, 2006). Research into field experience has all too often used small-sample studies, short-term treatments and measurements, depended upon a particular instructor or teaching technique, and has been disjointed across content areas (Clift & Brady, 2005). Though a large amount of highly diverse research in field experience has contributed a great deal, "little is known about the effectiveness of the various models for the delivery of field experience programs . . . models for student teaching and school experiences are developed out of convenience or tradition" (Guyton & McIntyre, 1990, p. 517).

2.2 Observation and Processing

One line of research that has contributed a great deal to a "how" of field experience is research in observation perception and attention. Research in observation perception has found fundamental differences in how individuals observe an instructional interaction based upon the observer's background and frame of reference. Further research into observer background has sought to understand the differences in how more and less experienced or expert individuals process classroom information and interactions. This section on observation perception and attention will review the impact of observational background, research into more and less experienced/expert processing, observational attention, and the impact of observational foci.

Research in observer background in music environments has studied the difference between music and non-music majors (Duke, 1991; Madsen & Duke, 1985; Prickett & Duke, 1992), differences in music major related experiences (Madsen & Cassidy, 2005; Yarbrough & Hendley, 1999), gender (Yarbrough & Hendley, 1999), and students who had/had not participated in a behavioral training program (Duke, 1987). Studies have found that music majors are more critical of music classroom events (Duke, 1991; Prickett & Duke, 1992), estimate greater amounts of approval (Madsen & Duke, 1985; Prickett & Duke, 1992), and focus on the teacher (Madsen & Duke, 1985) more than non-majors or music therapy students. Duke (1991) compared music and non-music major observations of a 12-minute 5th grade lesson. Groups were instructed to track approvals and disapprovals, count when a teacher elicited a verbal or musical student response, and note any other aspects deemed important. The study found that the non-majors gave significantly higher ($p<.004$) ratings of teachers than did music majors.

Madsen and Cassidy (2005) and Yarbrough and Hendley (1999) compared observational experiences across music majors with different specializations. Yarbrough and Hendley (1999) investigated the observations across music major (vocal or instrumental), gender, and level (graduate or undergraduate). Subjects used 10-point rating scales to rate rehearsal time use, musicianship, accuracy of instruction, student attentiveness, student performance quality, overall teaching effectiveness, enthusiasm and intensity, pacing, and personality. No significant differences emerged by major, gender, or level.

Research in more/less experienced or expert processing of stimuli revealed that there are important distinctions between groups based upon the subject's experience or expertness. One of the first studies that attempted to unlock the difference between novice and expert processing was a study of chess players by Chase and Simon (1973). This study presented subjects with patterns of pieces on a chessboard for a given amount of time and then asked subjects to reconstruct what they saw. The study found that a master chess player is far better than a novice at reconstructing typical patterns of chess pieces but relatively similar

to a novice at reconstructing random configurations of chess pieces. From these results, it was concluded that master chess players possessed an enhanced chess-related schema that allowed them to more effectively retain knowledge about typical patterns.

Researchers in teacher education have adapted this style of research in an effort to understand how teachers, novice teachers, preservice students, and postulants (individuals who intend to teach but have no training or experience) perceive and interpret classroom information (Berliner, 1986; Carter, 1987; Carter et al., 1988; Crowley & Medvedeva, 2006; Leinhardt & Greeno, 1986; Madsen et al., 1992; Madsen & Cassidy, 2005; Sherin, 2001; Standley & Madsen, 1991). Comparisons of novice-expert teacher processing have found that when experts are exposed to classroom stimuli, experts develop more accurate inferences (Berliner, 1986; Carter, 1987; Carter et al., 1988; Leinhardt & Greeno, 1986; Standley & Madsen, 1991), prioritize information (Carter, 1987; Crowley & Medvedeva, 2006), use a richer background knowledge to give a problem context and meaning (Carter, 1987; Carter, 1988; Carter, 1994), view classroom events as detached phenomena (Carter, 1988; Carter, 1993; Carter, 1994; Kagan, 1992), have automated responses (Leinhardt & Greeno, 1986), and organize and combine information under large schemas (Carter, 1994; Hanson & Hirst, 1989).

Just as expert chess players can hold multiple chess positions within a structural schema, expert teachers can organize a large array of educational stimuli under their own structural schemas. Carter (1988) noticed that when expert classroom teachers were asked to describe a large array of information, they typically described it as a single entity in comparison to a model of "typical" or "atypical." Carter (1987) concluded in another study that "expert teachers, like other experts, appear to bring rich schemata to the interpretation of phenomena, and these schemata appear to provide them with a framework for meaningfully interpreting information" (p. 156).

An analysis of inservice and preservice teacher observation notes during live and video observations revealed the use of different organizational systems used. Inservice teachers

used very brief notations for the recall of classroom activities while preservice students used much longer notations. Where one inservice teacher wrote "monitored work," a preservice teacher wrote "working crossword puzzles with open books while teacher assists." Both groups retained similar amounts of information, but from the language used, it was clear that inservice teachers stored information under broader categories than preservice teachers (Kagan & Tippings, 1992).

Another prominent feature of expert processing is the ability to prioritize information so that extraneous information is removed. Crowley et al. (2003) described the ability to limit "search space" as a prominent feature among more expert medical practitioners in the identification of skin abnormalities. The ability to prioritize and limit the amount of information processed assisted practitioners in making correct inferences about information. Carter (1987) found a similar "limiting" feature in the processing of expert teachers as they responded to stimuli. When presented with student work samples, a grade book, note cards with individual student information, and teacher notes, postulant and novice teachers attended to every piece of information. Experts only focused in on key pieces of information. One expert teacher referred to the need to focus in on students with the most immediate needs. The teacher stated, "I really didn't [try to remember information about students], because if I were going into that room, in 40 minutes, I might try to pick out students that had potential severe problems, hearing problems or something along those lines that stood out" (p. 149, brackets in the original).

When teachers attended to information, expert, novice, and postulant teachers differed in the amount of background knowledge that they brought to their observation and interpretation of classroom information. In three different studies, Carter (1987; Carter et al., 1988; 1994) found that experts frequently referred to background experiences when describing given stimuli. In contrast, novices and postulant explanations had a noticeable deficit of background information available to describe the stimuli. Carter (1994) stated, "novices,

who lack this situated knowledge, often struggle to make sense of classroom events and, in this struggle, their knowledge is shaped in fundamental ways" (p. 236).

The descriptions of classroom events that experts, novices, and postulants make also differ in the use of subjective or objective language. Preservice and novice descriptions of events are often embedded in a personal-emotional context that is viewed from the perspective of their immediate experience as students (Carter et al., 1988; Carter & Gonzalez, 1993; Carter, 1994; Kagan & Tippings, 1992). Inservice teachers tend to critically focus on objective elements of lesson structure (stating objectives, checking for understanding, summarizing). In contrast, preservice students observed the classrooms from the perspective of being a student with language such as "boring," "fun," and "condescending" (Kagan & Tippings, 1992).

Finally, experts and novices differed in the inferences that they made after observing and processing the encountered stimuli. Research has found that experts are able to solicit more complete information (Leinhardt & Greeno, 1986), recognize information in patterns (Berliner, 1986), and develop more cause and effect inferences from this information than either novice, preservice, or postulant teachers (Carter, 1987; Carter et al., 1988; Standley & Madsen, 1991). A study by Standley and Madsen (1991) examined inferences and the correctness of inferences in music classrooms among freshman, junior, and pre-teaching students, experienced teachers (1-10 years), and expert teachers (individuals who received recognition from the profession). Subjects (n=150) watched 20 one-minute videos of music education interactions and performances and were asked to "write as much as they could about what they saw" (p. 7). After scoring statements for correct factual (1 point) and inference (5 point) statements, Standley and Madsen found significant differences between the scores of all groups except between freshman and juniors. In descending order, experts had the highest mean accuracy/inference score (147.5) followed by experienced teachers (110.6), and novice (94.7), junior (70.5), and freshman (58.6) students. The authors concluded that experience was a factor in developing accurate descriptions and inferences.

The fields of physical education and music education have contributed research that yields contrasting viewpoints on the focus of attention in instructional observations. Analyses of attention in music observations have found that preservice students consistently focus on the actions of the teacher over the actions and responses of students (Duke, 1987; Duke & Prickett, 1987; Henninger, 2002; Yarbrough & Hendley, 1999). Physical education, with its focus on developing motor skills, has found a tendency opposite to that of music education. Preservice physical education students attend more to overt student movement than to any other aspect of classroom instruction (Allison, 1987; Barrett, 1987). This attention tendency may be the result of physical education coursework that trains students in observing and analyzing the motor skill movements of students.

While subject experience and background play a major in role in what individuals see and how they see, research that used attention focusing treatments found mixed results based upon the treatment or measurement used (Duke & Prickett, 1987; Madsen & Cassidy, 2005; Prickett & Duke, 1992; Yarbrough & Hendley, 1999). Attention focusing treatments most often consisted of videos that were focused on the student or the teacher. Duke and Prickett (1987) found that students were significantly more critical ($p<.05$) of the focused element (teacher or student) and that the teacher-focused group noticed significantly more ($p<.05$) teacher disapprovals than the student-focused group. Madsen and Cassidy (2005) found that teacher-focused students gave significantly higher ratings of teaching while in Yarbrough and Hendley's (1999) study, there was no significant difference between the two field of view conditions on comments and teacher ratings.

In a similar manner to the video treatment, differential observation task research focused student attention by providing differing observation attention instructions to students. Prickett and Duke's (1992) subjects were given tasks that directed attention towards approvals or disapprovals. The study found that there was a significant ($p<.001$) difference based upon the observation focus. Prickett and Duke stated:

> This study adds to the evidence that observers' evaluations of teaching may be affected differentially by observation tasks, an issue which seems most consequential in relation to both the format and the focus for observations by preservice teachers and for evaluations by administrators. (p. 47)

The effect of tools and tasks on student observation is an area that is worthy of further investigation.

From this line of research it can be concluded that experiences, field of view, and foci all have a significant effect upon observation attention and perception but that it is difficult to attribute the effect of perception and attention to any one variable. Differences in novice-expert processing may illuminate a desired goal; identification of the perceptive, schematic, and inference making qualities of experts may guide the inquiry into the development of preservice perception. The results of field of view and context reveal that observation perception and attention is as complex as the multiple stimuli that are processed.

2.3 Lesson Analysis

The structure of reflection and analysis activities during and after an observation is a critical component of preservice field experiences. Learning theories suggest that without critical reflection and analysis of experiences, meaningful learning does not occur (Ausubel, Novak, & Hanesian, 1978; Dewey, 1933; Fendler, 2003). Tools and structures may enhance the opportunities for critical reflection and analysis. This section will investigate the history of lesson analysis and structures that have been used for lesson analysis in music education and other fields.

Early teacher education in Normal schools was based upon finding a "normative" or single best way to teach. Lesson analysis consisted of uncovering the best way to teach. The 1950s brought about behaviorist and naturalistic lesson analysis approaches. These two contrasting approaches moved away from a single "best way to teach" to conflicting views on teaching practice. The behaviorist view sought to find the most effective behaviors within

a given context through analyses of behavior frequencies and qualities. Naturalistic inquiry was derived from social anthropological tradition and focused on finding the meaning behind actions. Since that time, video technology, transcript analysis, and the adoption of teacher evaluation tools have been used as means of lesson analysis (Wragg, 1987).

2.3.1 The adoption of teacher evaluation tools for lesson analysis

Since the 1950s, teacher education lesson analysis has frequently intermingled with the field of teacher evaluation. In a meta-analysis of observation systems, Rosenshine and Furst (1973) indicated that systems have been developed for the purposes of describing classroom practice (36 systems), teacher training (11), monitoring instructional systems (16), and investigating relationships between classroom activities and student growth (7). The authors noted that even though many systems were designed for supervisory purposes, teacher education frequently re-purposed these systems to facilitate preservice examination of teaching in context or preservice reflection.

Any evaluation instrument that seeks to identify or educate "good teaching" has a significant task. The construct of good teaching must be broken down into sub categories or competencies. These competencies reflect ideas about how much of "good teaching" is embedded within a context and if there are universal qualities that define "good teaching" in all contexts (Taebel, 1992).

Observation instruments are also constructed for either formative or summative purposes in teacher evaluation and teacher education. Hunter (1979) stated that formative evaluation uses information to "determine what needs to be done to improve a situation, action or achievement" (p. 41). In contrast, summative evaluation assigns a single rating to an entire entity such as completed, done, satisfactory, or unsatisfactory. Within formative and summative categories, observation instruments can be categorical, sign, rating, or descriptive instruments.

When an event is recorded each time it occurs, the instrument is labeled category systems; when an event is recorded only once if it occurs within a specified time period, regardless of how often it occurs during that period, the recording instrument is called a sign system. In sign system observation, "observers using rating instruments are expected to estimate the frequency of specified events or constellations of events only once, usually at the end of an observational session" (Rosenshine & Furst, 1973 p. 136). In addition, descriptive instruments are generally open-ended observation instruments that use a running timeline of notes or selective verbatim techniques during an observation (Zepeda, 2007).

Categorical, sign, rating, and descriptive instruments differ in the use of low-inference and high-inference items. Low-inference items require observers to judge the presence of events and behaviors and count the frequency of these behaviors (Rosenshine & Furst, 1973). In contrast, high-inference items require an observer to make a decision after processing cumulative cues or events. High-inference measures have been used to measure classroom climate constructs that are more affective and difficult to measure (Chavez, 1984). Descriptive or anecdotal observations can be either low-inference or high-inference depending upon the approach that the observer takes and the observer's use of subjective or objective language.

The purpose, type, and inference level all distort the reality of classroom events in such a way that the presence or absence of the most valued characteristics are made most salient. Categorical systems distort the events of a classroom such that all important events fit within a researcher-designed structure (Rosenshine & Furst, 1973). The distortion of events has been particularly useful to teacher educators who seek to guide preservice students to notice key stimuli.

The most prominent observational tool used in research and teacher education in the 1970s was the Flanders Interaction Analysis System (Rosenshine & Furst, 1973). The Flanders Interaction Analysis System emphasized the importance of the direct and indirect influence of a teacher upon students through low-inference categorical measures. Studies on the use of the Flanders Interaction Analysis System revealed that the experience of viewing the

classroom through the "lens" of this categorical system impacted the way that teachers later perceived and performed in the classroom. One study on the use of the Flanders Interaction Analysis System found that teachers who were trained in interaction analysis became more accepting of student input and allowed more time for student input in classrooms (Furst, 1967).

Research in music education has focused on the use of categorical and rating systems for the education and development of preservice and inservice teachers. Observation structures in the field of music education include Sequential Patterns (Arnold, 1995; Price, 1985; Price, 1992; Price & Yarbrough, 1993/1994; Yarbrough, 2002), Rehearsal Frames (Duke, 1994; Worthy, 2003), teacher intensity measures (Cassidy, 1993; Colwell, 1995; Madsen, Standley, & Cassidy, 1989), and structured behavioral observations (Standley & Greenfield, 1987). Sequential Patterns (also known as Complete Teaching Sequences), Rehearsal Frames, and a behavioral analysis system divided instruction into categorical patterns of event sequences. Teacher intensity analysis used a high-inference measurement of teacher energy or enthusiasm.

Research has used these analysis structures to describe expert instruction (Yarbrough, 2002; Worthy, 2003) and has found that the use of an analysis system improved observations and performances of a desired set of behaviors (Arnold, 1995; Cassidy, 1993; Madsen, Standley, & Cassidy, 1989; Price, 1992; Standley & Greenfield, 1987). A study by Arnold (1995) provided a group of teachers with Sequential Pattern information prior to self-analysis of video-taped instruction. Arnold found that the group that was trained with Sequential Patterns significantly increased proportions ($p<.05$) of music activities (from 24.6% to 45.9%) and complete teaching cycles (from 20.2% to 41.1%) in later instruction.

Standley and Greenfield (1987) found that students who used structured behavioral observations benefited more from repeated video viewing of teachers than students who used non-structured observations. Students who used behavioral observations categorized instruction into antecedent event, student behavior, consequent event, and the effect of the event upon

student behavior. Pre-intern students in the structured observation task scored significantly higher ($p<.01$) on a measure of recording accuracy than students in the unstructured observation task.

Other recent lesson analysis structures used in teacher development and education include the Teacher Education Project (Wragg, 1987), Video Clubs (Sherin, 2000; Sherin, 2001; Storeygard, 1995), the use of facilitated discussion (Van Zoest, 1995), and "Deep Viewing" methods (Pailliotet, 1995). Video Clubs have had an effective impact on the inservice and preservice training of mathematics teachers. This video-based training aimed to develop mathematics teachers' abilities to recognize and interpret student mathematical thinking. Sherin (2000; 2001) documented that participation in video clubs helped a teacher to move from identifying 'what-ifs' to slow down instruction and analyze the mathematical discourse of students in classrooms.

2.4 Tools for Lesson Analysis

Lesson analysis structures often employed the use of tools to enhance the perceptive capacity of observers. The use of video and this medium paired with software applications has been promoted as a tool to enhance the mental and perceptive capabilities of individuals as they engage in field experiences, observation, and lesson analysis. Video is defined as "a sequence of images relayed at a constant speed normally 25 to 30 frames per second (fps), with a synchronized audio track" (Smeaton, 2004, p. 374). Researchers have indicated that the advantages of video use in teacher development include the ability to isolate foci (Kagan & Tippings, 1992; Merkley & Hoy, 1985), repeat viewing (Daellenbach, 1970; Sherin, 2004; Taebel, 1992; Wang & Hartley, 2003), capture contextual information (Wang & Hartley, 2003; Wragg, 1987), view across geographic and temporal boundaries (Kinnear, McWilliams, & Caul, 2002; Leglar, 1992; Sherin, 2004; Wragg, 1987), and facilitate reflective processes (Brame, 2004; Sherin, 2004). Additionally, recent developments in the digital medium have

made video easier to store, more portable, and easier to navigate in more complex ways (Brame, 2004; Smeaton, 2004).

The use of video in an instructional context does not automatically guarantee that video is effective. Cuban (1986) cautioned that technology is too often proclaimed as a cure-all panacea. Numerous studies in the 1920s and 1930s consistently proclaimed that classroom films motivated students to learn and significantly increased test scores. Despite this early excitement, classroom films soon fell short of unrealistic expectations. Cuban pointed out that the lessons of the history of educational films, radio, and television should encourage a more disciplined approach to discovering the strengths and weaknesses of a new technology before declaring any new advancement as a magical cure-all.

A disciplined view of video in teacher education is likewise important in recognizing the limitations of this medium. Shortcomings of video include the passive role of the observer (Sherin, 2004), limitation of the field of view (Sherin, 2004), distortion of events (Taebel, 1992; Weade & Evertson, 1991), and the limitation of contextual information to that which is observable or audible (Sherin, 2004). As Hembree and Dessart (1986) indicated in an evaluation of the use of calculators, the question is not one of whether technology should be used but it is *how* technology should be used to further its educational role. Sherin (2004) echoed, "efforts should be made to characterize both what teachers learn as they engage with video and how this learning takes place" (p. 23). This section on the use of video as a teacher education tool will review a history and analysis of video research in teacher education and new directions for future video research.

2.5 A history of video and video research

The first research study that examined the use of video and teaching used a closed circuit television system that recorded images onto kinescopes. The study used video to observe student teachers and provide a stimulus for observation conferences and teacher reflection. While there were no significant differences between control and experimental groups, affective

measures indicated that both students and supervisors felt that the new technology was an important asset in the training of teachers (Schueler & Gold, 1964). Similarly, other early video research found no significant differences for video's impact on instruction, but affective measures continued to find positive support for the adoption of video in teacher education (Bloom, 1969; Winn, 1974).

Developments in video technology in the 1960s and 1970s greatly increased the usability of video in teacher education. In the 1960s, reasonably priced video technology was introduced with the Kodak Super8 camera. In the 1970s, Sony began to work on the development of videotape that would allow video captures to be easily stored. Finally, in 1980, Sony released its first camcorder for consumer use (Brame, 2004).

During the two decades of the 1980s and the 1990s, the development of the videodisc generated a wave of research into "interactive video" that has continued into the current emphasis on multimedia and on-line systems. Schweir (1987) defined interactive video as "a program intentionally designed in segments in which viewer responses to structured opportunities (menus, questions, timed responses) influence the sequence, size, and shape of the program" (p. 36). Descriptions of the development of interactive video programs organized capabilities into three levels of interactivity. These levels included (1) a video with simple navigational controls, (2) greater control enhanced by a more advanced video player, and (3) a system in which a microcomputer was used to control the play back of the videodisc (Floyd & Floyd, 1982; Kearsley & Frost, 1989; Schweir, 1987).

After McGraw-Hill developed the first interactive video program for use in biology (Floyd & Floyd, 1982), interactive video quickly developed into applications for learning in business, government, education, and music education. In commercial and government use, interactive video was adopted for use in CPR, Army (Kearsley & Frost, 1989), and hazardous materials training (Bosco, 1989a). Studies on the use of interactive video in education have occurred in physical education (Sloan, 2003), chemistry (Summers, 1990), mathematics (Goldman & Barron, 1990; Sherin & van Es, 2005), industrial arts (Dalton, 1989), medical educa-

tion (Branch et al., 1989), and an instructional pedagogy course on cooperative learning (Carlson & Falk, 1991). Interactive video and multimedia research in music education has been directed in conductor training (Fry, 1992), music listening activities (Hughes, 1991), lesson observation (Leglar, 1992), and music theory (Hullfish, 1972). The results of interactive video and multimedia research have been mixed with some studies claiming pedagogical effectiveness (Bosco, 1989a; Hughes, 1991; Hullfish, 1972; Sherin, 2005), effectiveness only on attitude measures (Bosco, 1989a; Branch et al., 1989; Fry, 1992; Summers, 1990), superiority (Carlson & Falk, 1991; Goldman & Barron, 1990), inferiority (Dalton, 1989), and no significant difference (Sloan, 2003).

2.6 Critiques of Video Research

Critics of video research have claimed that these mixed results are often the result of flawed methodology and measurement. Bosco (1989b) stated:

> One of the major problems which has afflicted evaluations of interactive video has been the faulty design of 'control group' treatments. The interactive video treatment is often compared with the instruction that interactive video is meant to replace. In such cases, the Hawthorne Effect is a likely prospect. (p. 147)

Likewise, the measurement of effectiveness has often been relegated to affective measures of "did you like it?" (Frager, 1985; Wang & Hartley, 2003).

In a seminal critique on research in media, Clark (1983) stated that research problems also existed in the impact of the instructor, length of studies, claims of efficiency, and transferability across academic disciplines. Clark noted that research studies that use multiple instructors with new media systems have a larger mean effect size (.51) than studies that use the same instructor (.13). Likewise, the length of the study seems to have an impact on the effect size of the studies. Studies of less than 4 weeks have a mean effect size of .56 whereas studies lasting longer than 8 weeks have an effect size of .2. Claims of efficiency are often developed only after the researcher has spent extensive time developing the technology. The

effectiveness of the media may be tied to discipline or problem within which it is embedded and therefore claims of effectiveness are not always transferable to other situations.

Despite the pitfalls of early interactive media research, important roles remain for research into media and the development of video technology. Reeves (1990) advocated leaving behind the search for universal superiority of a form of media over "traditional instruction." Instead, he called for a search for how media can be most effectively used with given disciplines and contexts. The use of design-based research that is paired with a wide variety of measures is one possible important new direction for media research (Design Based Research Collective, 2003).

2.7 Video as a teacher education tool

Developments in interactive design and affordability effectively set up video for a period of extensive use and research in teacher education. An affordable, portable, and flexible tool was finally available for capturing and representing the complexities of the teacher's classroom. The use of video as a teacher education tool has focused on video as a tool for collapsing distances (Kinnear, McWilliams, & Caul, 2002; Merkely & Hoy, 1985), case-based instruction (Lampert & Ball, 1990; Lampert & Ball, 1998; Sherin, 2004; Shulman, 1986), diagnostic skill development (Atwater, 1991; Froseth & Hopkins, 2004; Stuart, 1979), microteaching (Bloom, 1969; Butler, 2001; Sherin, 2004), reflection and self-analysis (Fiorentino, 2004; Laffey & Musser, 1998; National Board for Professional Teaching Standards, 2008; Winn, 1974), and lesson analysis (Brame, 2004; Fishman, 2004; Sherin, 2000; Sherin, 2001; Sherin & Van Es, 2005; Storeygard, 1995).

Video is a tool that has collapsed distances between the college classroom and model teachers (Merkley & Hoy, 1985) or diverse field placements (Kinnear, McWilliams, & Caul, 2002). Kinnear, McWilliams, and Caul (2002) used video conferencing technology to link a 200 student college classroom with a rural Irish school that was not otherwise accessible.

The video link allowed the 200 students to observe a classroom in a non-obtrusive way and the college instructor to comment on instruction as it occurred.

Case-based instruction is another model of collapsing boundaries that has been promoted as a means of providing students with in-context repeated access to instances of public school instruction (Grossman, 2005). Shulman (1986) stated that case-based instruction assisted preservice teachers in situating the "propositions" of teacher education within rich contexts. The use of case based instruction in music education has been advocated by Abrahams and Head (1998) and Conway (1999) as a means of providing music students with access to a wide array of complex contexts and music teacher decisions. Research into the use of video case-based instruction has found that video cases facilitated inquiry (Baker, 2005; Lampert & Ball, 1998; The Cognition & Technology Group at Vanderbilt, 1997) and developed preservice teacher confidence (Bliss & Reynolds, 2004; Goldman & Barron, 1990), knowledge about teaching and learning (Bliss & Reynolds, 2004; Lundeberg & Sceurman, 1997; Nagarajan, 2006), and preservice teacher performance and teaching skills (Goldman & Barron, 1990; Nagarajan, 2006).

Lampert and Ball (1990; 1998) developed one of the most extensive video case-based instruction systems. The project grew out of the belief that teaching is an ill-structured domain in which knowledge is firmly situated in practice. The authors asserted that preservice students needed to study a wide range of data including videos from multiple perspectives, examples of children's work and teacher feedback, and reflections and commentary (Lampert, 1990). Lampert and Ball (1998) proceeded to collect materials from a classroom over the course of a year and embed these materials into an Apple HyperCard system. Within this open-ended environment, preservice students made a variety of investigations into classroom practice as a component of their coursework.

Music education has adopted video use to represent cases to assist the development of student diagnostic capabilities. Music educators are frequently asked to diagnose a wide variety of performance problems within an instructional context. To assist preservice students

in developing these diagnostic skills, video and multimedia tools have been developed to assist the development of diagnostic skills for trombone teaching (Atwater, 1991), woodwind and brass instruction (Froseth & Hopkins, 2004), and conductor training (Stuart, 1979).

Microteaching has been greatly enhanced by the use of video. A previously cited study by Bloom (1969) indicated the early relationship of microteaching and video. The study had diverse affective results with a majority of the students claiming excitement about taking on the role of the self-observer. One student claimed that video self-reflection provided an incentive to go on a diet.

Video has been widely cited as a tool that aids preservice teachers with reflection and self-analysis because of its ability to record contextual information for later use. A study by Fiorentino (2004) incorporated the digital editing of video to develop reflective processes in students. Fiorentino asked students to edit videos of model performances and performances needing improvement in different competency areas. Students used this video to further facilitate reflection and used a video portfolio as an asset for job interviews upon graduation.

Finally, video has been advocated as a tool that facilitates the analysis of lessons. Previously cited studies on the use of videos in "Video Clubs" found that math teachers can use videos to analyze student responses within lessons (Sherin, 2000; Sherin, 2001; Sherin & van Es, 2005; Storeygard, 1995). The KNOW project in Michigan used disseminated video as a method of providing model examples for analysis and use in curriculum reform (Fishman, 2004).

One important development that revealed the embeddedness of video into the teacher growth process was the adoption of video by the National Board for Professional Teaching Standards (2008). Teachers who sought certification as a National Board Certified Teacher collected multiple videos of teaching for analysis, self-reflection, and assessment by the National Board for Professional Teaching Standards. This organization cited that this process of assessment and self-analysis strengthened teaching practice and advanced teaching careers.

2.8 Directions for the Use of Video in Field Experience

The pairing of metadata with digital video has offered new directions for the development of tools that facilitate field experience reflection, analysis, and feedback. Metadata is data that is attached to time codes and events in video that can be used for searching and further interactive capabilities (Smeaton, 2004). Early video research used audible beeps and a split screen capture of a digital clock as a crude way of attaching events to time codes (Tribe & Gibbs, 1977). A more recent example of how video can be made more powerful when paired with related data sets is Hayes' (2007) research in the use of video within a special education classroom. In this research study, teachers used small remote clickers to segment video and indicated important behavioral moments for autistic children. After lessons, teachers printed out graphs of behavioral frequencies and viewed the attached video segments of each event. The simplified interface and specialized development of this tool for special education lead to the successful use of this tool within its context.

Video analysis tools developed by Sherin and van Es (2005) and Bryan and Recesso (2006) revealed how the pairing of metadata with video could aid students in analyzing instructional events. Bryan and Recesso's Video Analysis Tool (VAT) allowed students to capture, upload, segment, reflect, and assess their videos in an online system. Additionally, students have the ability to work collaboratively with other students and instructors by "sharing" their videos in the online system.

Research by Kinnear, McWilliams, and Caul (2002) and Merkeley and Hoy (1985) has given insight into the power of integrating teacher education instruction with video-mediated in-progress observations. Both studies used live video feeds into teacher education classrooms. These live video feeds allowed the instructor to comment on instruction and direct preservice student attention during the observation with no interference to the observed teaching.

Feedback to students on their reactions to field experiences has often been delayed because of the time demands on coordinator's time. Research in other areas has found that accurate and timely feedback significantly improves student performance on measures of achievement

(Black & William, 1998; Elawar & Corno, 1985; Summers, 1990). Black found that studies which used formative feedback as the independent variables had high effect sizes between 0.4 and 0.7. Likewise, feedback effectively narrowed the gap between low and high achievers. Such timely feedback to student observations has proved elusive for many field experience coordinators.

Leglar (1992) sought to solve problems of instruction, feedback integration, and access to quality field experiences through the use of a multimedia video tool. Using Apple HyperCard, Leglar developed a program to guide students in observations and the development of lesson plans. The observation component used an observation framework based upon the Georgia Teacher Observation Instrument to train students in well-defined elements of effective instruction. Opportunities for student responses were paired with conditional feedback and video exemplars. Results indicated that students valued the program as a method for learning about expectations for classroom performance and lesson planning.

The development of video as a field experience tool has prompted comparisons of video-mediated field experience and live experience. Research that compared live experience and video-mediated experience has found that video-mediated observation may be at worst no different than live observation (Winitzky & Arends, 1991) and at best advantage individuals who use video-mediated observation (Eckrich et al., 1994; Kagan & Tippings, 1992). If new technology allowed for event segmentation, analysis, instruction, and feedback to occur in an integrated field experience process, the advantages of video-mediated observation may outweigh those of live observation.

2.9 Conclusion

Field experience has been identified in literature as both an important element in connecting pedagogical knowledge to contexts and as a curricular element that has a wide variety of associated problems. Research on observation has found that a wide array of variables impact what students see and how they see. In developing preservice teachers to become “more

expert," methods of lesson analysis and the development of tools have been proposed as a means of connecting the learning in teacher education classrooms with observation classrooms.

Assistive tools for field experience have the potential to provide rich contextual information, overcome barriers of time and geography, provide more diverse experiences, and guide the observation of students using embedded prompts and feedback. Using on-line technology, a tool could be developed that breaks down barriers of geography and time and more adequately connect teacher education coursework to initial field experiences. Therefore, I hypothesize that:

1. The experience of an integrated multimedia approach to observation is superior to live observation in developing pedagogical knowledge and lesson analysis skills;

2. There will be no effect of gender, technology experience, and year in school on the effectiveness of an interactive observation tool; and,

3. Students will value an experience with embedded feedback.

Chapter 3

Methodology

This chapter will introduce the design of the study, development of tools, research context, participants, measurements, and the procedure followed in this study. The research study consisted of two parallel studies conducted over a 12-week period from September to November of 2008. One study (Music Major Study) compared the effect of live and computer-mediated video conditions on music education majors analysis of field experiences. The second study (Early Childhood Study) compared the effect of projected video and computer-mediated video on early childhood education majors analysis of field experiences.

3.1 Study Design Overview

Both studies implemented a repeated measures control-experimental group design. The between-groups factor was the type of observation that subjects attended in weeks 2-11. Within-subjects factors included gender, year of study, age, major, desired occupation, prior field experience, and experience with technology. At the beginning and end of the study, a pretest and posttest was implemented using a paper-based observation form in the control treatment environment of each study. Pretests and posttests were administered in either a live environment (Music Major Study) or a projected video environment (Early Childhood Study). In between pretest and posttest measures, subjects conducted eight weeks of field experience observation activities in either a control treatment (live or projected video) or an experimental treatment (computer-mediated observation) (Appendix B).

Table 3.1: Observation Sites.

	Observations	***Economically Disadvantaged Rate**	****Census Designation**
1	5th grade elementary music (pretest)	0.19	Rural
2	High School Chorus	0.14	Rural
3	5th grade elementary music	0.17	Rural
4	High School Band	0.31	Rural
5	7th Grade Band	0.17	Rural
6	7th Grade Chorus	0.17	Rural
7	High School Band	0.40	Urban-Cluster
8	8th Grade Band	0.30	Rural
9	Kindergarten elementary music class	0.55	Rural
10	5th grade elementary music class (posttest)	0.19	Rural

*Source *Georgia Department of Education, 2008, **United States Census (2000) retrieved from http://www.census.gov/geo/www/ua/uaucinfo.html#lists on February 10, 2009*

Participants in both studies attended or viewed ten observations with two of these observations occurring as the pretest and posttest site. Observation sites were selected from recommended schools by a panel of four college faculty members and three graduate assistants. The panel was asked to recommend positive exemplars of teaching that would demonstrate a diversity of quality teaching styles. From the panel results, the top selections were contacted in order of agreement among the panel. The site and teacher with the greatest degree of agreement among the panel was chosen to be the pretest and posttest site for the study. The pretest and posttest site used the same teacher teaching a lesson to the same grade level (5th grade elementary music). In between these two observations, participants attended eight observations in their treatment environment (See table 3.1 for a listing of school sites attended or appendix I for a description of observation sites).

The music major control group completed eight observations in the observed classroom environment for the eight weeks between pretest and posttest using the paper-based multi-

Table 3.2: Rating Scale.

Point	Description
0	Irrelevant
1	Relevant
2	Detailed Reflection

state observation instrument (live experience). Video was captured during these observations for use in the music major and early childhood computer-mediated treatment (experimental groups) and the early childhood control treatment (projected video). To allow time for video coding, upload, and analysis by a panel of experts, the projected video and computer-mediated groups viewed the video of the observation one week after the music major live group watched the same observation. Groups were offset from the live group by one week at the beginning of the study and the live group was given a one-week hiatus prior to the posttest (Appendix A).

The video was coded and analyzed by a panel of experts as part of the feedback system that was embedded in the computer-mediated treatment. Immediately following the observation, three graduate assistants or faculty members were asked to log into the system and complete the observation form. Their input was used as feedback and "more info" in the computer-mediated tool.

Pretest and posttest data was analyzed for accuracy and quality of response using a panel of four raters and a rubric (table 3.2). After an initial training session, raters achieved a reliability rating of r=.82 using the interrater reliability formula (Boyle & Radocy, 1987). Raters then rated posttests and pretests using the rubric.

In addition to pretest and posttest data, data was collected from students through surveys and the capture of student discussions. Survey demographic data was captured from students at the beginning of the study (Appendix D). At the end of the study, students com-

pleted a summative survey that focused on aspects of their experience, knowledge gained, satisfaction, and perceived advantages and disadvantages of their participation in their treatment condition (Appendix F). Student discussions were captured as online discussions (Music Major Study) or live group discussions (Early Childhood Study). Live group discussions were recorded and later transcribed for analysis.

3.2 Development of Tools

Two tools were developed for use in this study. A new observation form was developed to represent an analysis of teacher performance standards as collected from every state in the United States. A new online video tool was designed to facilitate student's analysis of digital video with the use of online collaborative feedback. The theoretical underpinning behind the observation instrument is that a tool that was constructed from a thorough analysis of state teacher performance standards would provide a strong framework for the investigation of "good teaching." Likewise, the online tool was built from the premise that opportunities to control the playback of events, reflect on specific occurrences, and receive expert feedback would enhance a students' analysis of instructional events.

3.2.1 Multi-State Observation Form

The Multi-State Observation Instrument was constructed from an analysis of teacher performance standards from every state that had these standards (Appendix E). After contacting every state department of education in the United States, it was determined that 33 states had state-level teacher performance standards. Teacher performance standards were obtained and every teacher performance domain and indicator was entered into a database for analysis. An accumulated 225 teacher performance domains and 1,492 indicators were collected in the database for analysis. A web-based content management system was then built to allow a panel of reviewers to categorize and classify the domains and indicators. Using a panel of

Table 3.3: Major categories of teacher performance domains.

Domain Category	**States**	**Total**
Classroom Management	27	29
Instruction	24	26
Assessment	23	25
Instructional Planning & Delivery	21	21
Reflection/Professional Development	19	20
Professional Characteristics	17	18
Communication	12	12
Knowledge: Content & Pedagogy	12	13
Collaboration	12	12

six reviewers (two public school teachers, one former school administrator, and three college professors), domain and indicator categories were developed over two rounds of analysis.

In the first round of analysis, teacher performance domains were grouped and categorical definitions were constructed for the groupings. Reviewers, submitted feedback on the definitions and the classification of performance domains within these definitions. Thirteen domain categories emerged in this round of analysis. A frequency analysis was conducted to determine the number of states that had at least one domain within each domain category and the total number of domains within each domain category. The most frequently referenced domain categories are presented below in table 3.3. The four dominant domain categories that emerged from this analysis were Classroom Management (27/33 states), Instruction (24), Assessment (23), Instructional Planning and Delivery (21), Knowledge of Content & Pedagogy (12), and Instruction (24).

In a second round of analysis, indicators were read, grouped, and definitions were constructed for the most significant indicator groups. Indicators were categorized into 104 categories using the category definitions. A panel of reviewers provided feedback and recommendations on the definitions of indicator categories and indicator categorization. Again,

a frequency analysis was conducted to determine the number of states that had at least one indicator within each indicator category and the total number of indicators within each indicator category.

After an analysis of the indicators within major domain categories, it was determined that the domain categories of Reflection/Professional Development, Professional Characteristics, Communication, and Collaboration referenced items that could not be easily observed within a single classroom observation. These items often referenced attendance at professional learning activities, professional behavior, and communication and collaboration with colleagues and superiors. After consultation with the reviewing committee, it was agreed to condense Instructional Planning & Delivery, Assessment, and Instruction into one category to simplify the observation instrument.

Therefore, the categories of Classroom Management, Instruction, and Knowledge of Content & Pedagogy formed the major organization framework of the observation form. Observation form questions were constructed from each of the dominant indicator category definitions.

It was the objective of this observation form to achieve a balance of low and high inference questions as well as a balance between identification, rating scale, and free response questions. To achieve this balance, questions were analyzed to determine the response-type that best fit the nature of the question. After completion of the observation form questions, the Multi-State Observation Form was reviewed by a panel of two faculty members experienced in teacher supervision and then pilot tested by a panel of graduate students.

After review and pilot testing, participants suggested that the observation form could be made more usable by grouping response types together. Therefore, response types were grouped and a new section titled "Event Identification" was added to group low-inference identification questions. The observation instrument was pilot-tested by a panel of graduate students who had previously facilitated field experiences and minor adjustments were made to improve the readability of the document.

3.2.2 ClassObserver Online Video System

Past researchers used digital video and online technology to develop video analysis tools that allowed individuals to segment videos and attach reflections and assessments to video events (Bryan & Recesso, 2006; Sherin & van Es, 2005). The video analysis tool developed by Bryan and Recesso allowed users to segment video into clips by defining the beginning and ending time codes of events. Users then attached reflections and rubric-based assessments to these events.

The tool designed for this study was designed in Adobe Flash so that it could be accessed through a standard web browser on either the Windows or Macintosh operating systems. This tool used video time codes obtained from the 'playhead' position to connect prompts from the lesson observation instrument to video events. Questions from the standardized observation form were embedded across separate screens not to exceed three prompts per screen. Studies on the development of multimedia technology have found that excessive information per screen increases the cognitive load of the task and thereby reduces the quality of the outcome (Chandler & Sweller, 1991; Mayer, 2001).

Students had access to play, pause, rewind, and fast-forward embedded video. Students could press a button to identify an event and/or provide descriptive and evaluative information using radio buttons and text boxes (Appendix C). Upon pressing a submit button, the computer application compared the student's responses to that of an expert and provided immediate feedback as to the accuracy of the response.

The tool developed for this study (ClassObserver) was developed based upon theoretical principals of distributed cognition (Kim, 2004), cognitive load theory (Chandler & Sweller, 1991; Mayer, 2001), the importance of formative feedback (Black & William, 1998; Black et al., 2004; Bangert-Downs et al., 1991; Elawar & Corno, 1985; Hullfish, 1972) and attention cueing (Merkley & Hoy, 1985; Nagarajan, 2006). The development of the program interface was developed with a concern for enabling the user to perform the task of structured observation with minimal mental and operational load.

The technology for this study was developed based upon the theoretical framework that immediate conditional feedback, attention cueing, and opportunities for practice aid in the field experience observational process. Previous researchers identified results favoring the use of feedback in meta analyses (Black & William, 1998), mathematics (Elawar et al., 1985), and music education technology (Hullfish, 1972). Researchers identified that feedback acted as a motivating stimulus and source of verification and elaboration (Kulhavy & Stock, 1989; Shute, 2008). Kulhavy and Stock cited:

> [Feedback] primarily acts as a unit of information, and has its greatest effect when it follows an incorrect response. Feedback allows students to correct errors; confirms right responses; and generally assists learners in adapting to the requirements of the instruction on which they are working. (p. 15)

Providing students with accurate and relevant units of information embedded within a computer-mediated experience was a fundamental component of the ClassObserver system.

Attention cueing and opportunities for practice have been identified as important elements in technology and specifically in technology designed for field experience. One of the advantages of using video-mediated observations is that the university instructor can cue observers' attention to specific classroom events (Merkley & Hoy, 1985). The observation tool in Merkley and Hoy's study cued students attention by providing links to events in the video with corrective feedback.

Safety features were used to protect the use of classroom videos and student responses. Videos were stored on a protected project server at the University of Georgia College of Education and access was protected using a username and password enabled login system. The College of Education project server offered firewall protection, automatic patching, secure backups, staff to monitor logs for tampering and security violations, and the ability to password protect directories. Usernames, passwords, and videos were stored in a password protected MySQL database and accessed via a PHP script. Access to the database was secured by placing all database password and access information in a protected server

folder. Information in this folder could only be accessed by the web page through a PHP "require once" script. This script enabled sensitive variables and methods to be loaded while preventing non-registered users from accessing these variables and methods.

User passwords were changed on a weekly basis to prevent access to videos between treatment sessions. Student responses were stored in the database and access to the student responses was given only to the researcher. The researcher downloaded and prepared weekly student reports for course-assessment as required by the course instructor.

The size and parameters of the video within the computer application were defined according to recommendations by Larson and Constantini (2007). An analysis of the bandwidth in the University of Georgia Music Education computer lab revealed that the bandwidth was 2300.1 kbps. Based upon this high bandwidth reading, the video used in this computer program was 512 pixels wide by 384 pixels high. Video compression used a variable bit rate and was compressed for progressive viewing. [1]

The video tool was field-tested in a pilot study that was conducted to examine usability issues and feedback. The use of usability and user testing was recommended as a formative component within design-based research (Design-Based Research Collective, 2003). Participants were 10 music education teachers enrolled in graduate level research class. Participants engaged in the analysis of a video of a college classroom teacher using the software. Screen-capture software was used to capture videos of how participants used the software. Additionally, participants engaged in a recorded focus-group discussion on the merits and challenges of the video tool.

Major corrective themes that emerged from the focus group session and user-produced videos included problems of the tutorial video and question navigation. Participants cited that the tutorial video presented too much information at too fast a pace. Question navigation

[1] In variable bit rate video compression, the compression engine analyzed key frames at a variable rate depending upon the amount of movement in the video for the smallest file size possible. In progressive viewing the entire movie clip is downloaded to the computer's memory upon web page load.

Table 3.4: Comparison of the Music Major and Early Childhood Study Environments

	Music Major Study	**Early Childhood Study**
Participants	n=19	n=28
Time Allotted	1+ Hours	50 Minutes
Classes	Participants From 1 Class	Participants From 2 Classes
Observation Discussion Format	Online WebCT Discussion Within Groups	10-min. Verbal Discussions Within Groups

was cited as being cumbersome. Participants cited problems with finding the correct question for the video event.

Regarding the merits of the video tool, participants cited that the ability to control a classroom observation (through play, stop, fast forward, rewind) was a major positive feature. Participants cited that they felt that the tool would enhance undergraduate field experiences by allowing students to investigate a classroom at a deeper level. Based on corrective recommendations and citation of merits, the video tutorial was reworked to improve pacing/organization of content and the question navigation feature was examined to determine how questions could be more easily navigated.

3.3 Research Context

The two parallel studies were conducted in two different contexts. The Music Major Study was conducted in an Educational Foundations class for music education majors that had an integrated field experience component. The Early Childhood Study was conducted across two sections of a course titled Integrating Music into the Elementary Classroom (table 3.4).

3.3.1 Music Major Study Context

The Educational Foundations course was a course provided to junior level music education majors at the University of Georgia. This course is the first in a sequence of four music education courses that lead to student teaching. The Educational Foundations course is the first field experience that music majors participate in that is directly related to music education. At the beginning of the course, the instructor spoke about his vision for the course:

> What I envision is a soul searching course. We take a panoramic view of education and a lot of the issues about what we do. As a result of going through that process, you do some serious soul searching about what is teaching for me? So my goal is to make this as real and as clear as I possibly can . . . I want to make you think about teaching and those reasons for going into teaching. There are specific components to it, but that is the central component to this course.

The central "soul searching" focus to this course was thoroughly reflected in his approach to in class discussions and projects.

The primary objectives for the course as stated in the course syllabus included the development of an understanding of various historical, philosophical, political, and social movements in education and music education. Among culminating projects, students were to develop and write a philosophy of music education. The course was organized such that students spent the first half of the semester studying the historical, political, and social foundations of general education and the last half of the semester focused on the same topics in the context of music education. Each student also gave a presentation on topics that included educational policy issues, arts education policy issues, famous people in general and music education, general and music education methodologies, and governance/support organizations.

Field experiences in the Educational Foundations course involved 10 observations over 10 weeks. These observations are arranged to occur in a variety of instructional contexts

(urban, rural, choir, band, general) and grade levels. Students observed schools on Friday mornings and attended class on Monday and Wednesday mornings.

The majority of course grades were weighted based upon three written exams on the text and reserved readings (45% of course grade). Students were also assessed on the final exam (15%), a special topic presentation (10%), a philosophy of music education paper (10%), and class discussion participation (5%). Field experience was not listed as a proportion of the course grade, however it was listed as competency-based, meaning that full completion of the requirements of this component was expected. Within the field experience component, all students, regardless of participation in the research study, were required to attend 10 observations of prearranged school classrooms and turn in an observation form at the class period following the observation. All students (research and non-research) received a check, check-minus, or check-plus grade based on the completion and quality of responses on their weekly observation forms (Rubric in Appendix H).

3.3.2 Early Childhood Study Context

The early childhood course on Integrating Music into the Elementary Classroom is described in the course syllabus as a "course primarily for the elementary school teacher, designed to provide basic music fundamentals, materials, and methods currently employed in the elementary school class." The course instructor explained that the course was a balance of learning about musical concepts, pedagogical knowledge related to classroom management and lesson design, and the development of diverse musical skills. The instructor stated, "the goal of the class is that when they leave the class they'll be able to use music as a tool to help the students in the class, to make children's education more fun and more enjoyable through use of music."

The sequence of course activities began with a focus on solfege, musical concepts, and different pedagogical methods. This early knowledge was reinforced throughout the semester with three rote song presentations that built upon each other in skills and requirements.

After beginning the class, the course instructor also incorporated a study on classroom management using a text titled *Assertive Discipline* (Canter, 2001) and input from *Teaching Discipline* (Madsen & Madsen, 1998).

The largest proportions of the course grades in this class were designated to three teaching lessons (35%) and the final exam (15%). Other significant components included participation in a weekly piano lab (10%), a test on discipline and music concepts (10%), a music textbook/resources project (10%), and two concert reports (10%). The research field experience portion of the course was incorporated into the pop quizzes section of the course grade (10%). Students received an A in this section of the course if they attended weekly research sessions and completed the required observation form. Students were given a grade of check-minus, check, or check plus on each observation form for feedback purposes however the course instructor chose not to consider this level of grading and to grade on complete/incomplete.

3.4 Measures

Pre and posttest assessments were conducted within a live observation environment with the use of the Multi-State Observation Instrument. All participants traveled to a local public school elementary music classroom and observe one period of music instruction. During the observation, students had access to the observation instrument for recording notes and answering questions. Students then turned their observation forms in to the researcher on the Monday following the Friday observation. Students were reminded of the university academic honesty policy and told to refrain from discussing or sharing observations until after all forms had been turned in. The posttest took place in the same public school classroom with the same teacher exactly 11 weeks after the administration of the pretest measure.

Questionnaires were administered to students with the intent of identifying within-subjects factors of age, year in school, gender, desired occupation, major, prior field experience, and technology experience. With regard to technology experience, subjects were asked to identify previous experiences with computer-assisted instruction, familiarity with the

use of online and digital video, and amount of time spent per week in using the computer (Appendix D).

A summative feedback and evaluation questionnaire was used at the end of the study to obtain open-ended responses about subjects' experiences with observations and technology (if applicable). Questions specifically addressed issues of ease of use, perception of advantage/disadvantage, and perception of the contribution of the treatment to their learning and development as future music educators (Appendix F).

To determine the qualitative differences between live and virtual experiences, student discussions were captured in both online (Music Major Study) and live (Early Childhood Study) environments. In online discussions, music majors were required to provide two posts per week that responded to their field experiences. Treatment groups were separated in the online discussion environment such that each group could only read and post discussions within their treatment groups online environment. Minimal guidance was provided for online discussions in an effort to mitigate researcher influence.

Live discussions in the Early Childhood class were conducted during the final 10 minutes of each observation. Two course teachers and the researcher took turns at facilitating group discussions with two questions as defined by a group discussion protocol (Appendix G). Participants were asked to identify either a positive or negative significant event and to rate the observation using a Likert-scale and provide a rationale. Thirty live discussions were recorded and later transcribed for analysis.

3.5 Procedure

Two parallel studies were conducted during a 11-week period in the fall semester. The Music Major Study compared the difference between live and computer-mediated observation. The Early Childhood Study compared the difference between projected video and computer-mediated observation treatments (See appendix B for pictures of treatment conditions). Both studies used a pretest-posttest control-experimental group design (Appendix A).

3.5.1 Music Major Study

The study took place during 11 weeks of the fall semester in 10 sessions. Sessions one and ten combined control and experimental groups in a live observation for the pretest and posttest measures. Sessions two through nine took place according to the control (live experience) or experimental (computer-mediated) treatment condition. The experimental group met in a computer lab with Macintosh G4 computers with the installed Firefox web browser.

To ensure random section for control and experimental groups, a list of random numbers was generated using a computer-based random number generator. A complete list of all students in the Educational Foundations course was used for random selection after the conclusion of the university drop/add period and the collection of signed consent forms. Once selected, students were notified of their random assignment to either a video or live observation group for the duration of the semester.

Following selection, two different informational sessions were held with all participating students during an "information week." In information session one, participants were provided with a copy of the standardized observation instrument. In this session, the course instructor guided participants in the use of the observation instrument during an example video. All relevant questions about the observation form and the language on the observation form was answered for the participants.

In information session two, the questionnaire about age, gender, year in school, technology experience, and motivation as related to the course was administered. Following the survey, control and experimental groups were separated for informational sessions. The control group was given a list of schools, professional dress codes and expectations, and travel information about live experience observations. The experimental group was given information about the pretest observation (directions, requirements for professional attire), introduced to the technology tool, and given a practice password and username for use with the tool. Using a practice video, participants interacted with the video system and became comfortable with the tool.

Control and experimental participants traveled to their first observation experience (pretest) one week following the final informational meeting. Once at the observation, students were given a copy of the Multi-State Observation Form. At the conclusion of the observation, participants were informed that they were not to compare or discuss answers per the university's academic honesty policy and asked to turn in the form to the researcher on the following Monday.

During sessions two through nine, the control group continued to attend selected schools for live observations. In each observation, participants were presented with the observation form prior to the observation. At the conclusion of the observation, all observation forms were returned to the instructor on the Monday following the Friday observation.

A video camera was set up next to the control group during all sessions. The video camera was adjusted to most accurately reflect the viewing angle and field of view of the control group. The zoom level of the video camera was set to wide-angle to capture a field of view comparable to that of live observations. At the conclusion of observations, videos were uploaded into the online system, coded for use with the online observation instrument, and feedback for correct and incorrect responses was generated.

The experimental group took a one-week break following the initial pretest measure to set the control group ahead of the experimental group. The one-week difference provided the researcher with time to film, upload, and code the video in the online system for use with the experimental group. When the control group concluded session nine, the control group took a one-week break to allow the experimental group time to complete the final treatment observation prior to the posttest.

At the conclusion of each experimental group session, all members reported to a university computer lab and were given their password for the week's observation. Passwords were changed weekly to prevent participants from accessing video materials between sessions. Following each treatment session, videos were deleted from the server to ensure maximum security of video data. Once provided with passwords, participants accessed the video and

begin interacting with the online tool. At the conclusion of each observation, participant observation form input was downloaded for submission to the instructor.

In between field experiences, subjects participated in online discussions on WebCT. At the beginning of the semester participants were instructed to make two postings per week of at least a paragraph in length about a significant event or issue in the observation. Discussion was left open-ended and participants were encouraged to read each other's posts and dialogue about field experiences.

At the conclusion of each observation session, completed observation forms were either printed (computer-mediated group) or returned (live experience group) to the researcher. As requested by the course instructor, each question was graded using a check-minus, check, and check-plus rubric (Appendix H) and a grade was assigned to the observation form. Observation forms were graded and returned by the researcher to ensure consistency in grading. Written feedback was provided to any student if a question was not addressed or to request more reflection, effort, or detail.

Once the experimental and control groups completed session nine, participants attended a live observation environment together for the posttest measure. In the same manner as the pretest, subjects were presented with the paper-based observation form and used the instrument during the observation of live instruction. After the observation, participants were once again reminded not to share answers or dialogue with others about the observation until they had returned the forms to the instructor on the Monday following the observation.

The summative feedback and evaluation questionnaire was administered following the posttest measure. Individuals answered questions about their experience in observations and experiences with the technology tool (if applicable). Participants were informed that their responses on the feedback and evaluation questionnaire had no affect on their course grade.

3.5.2 Early Childhood Study

The study took place during 10 weeks of the fall semester in 10 sessions. Sessions one and ten combined control and experimental groups in a projected video observation for the pretest and posttest measures. Sessions two through nine took place according to the control (projected video) or experimental (computer-mediated) treatment condition. The experimental group met in a computer lab with Macintosh G4 computers with the installed Firefox web browser.

Participants were students enrolled in one of two different course sections of a course titled "Integrating Music into the Early Childhood Classroom." To ensure random selection, participants were pooled together across both sections and assigned a random number using a computer-based random number generator. Once selected, participants were notified of their assignment to either a projected video or computer-mediated group for the duration of the semester.

Following selection, two informational sessions were held with all participants during an "information week." In information session one, participants were provided with a copy of the observation instrument. In this session, the course instructor guided participants in the use of the observation instrument during an example video. All relevant questions about the observation form and the language on the observation form were answered.

In information session two, the questionnaire about age, gender, year in school, technology experience, and motivation as related to the course was administered. Following the survey, the experimental group was introduced to the technology tool, and given a practice password and username for use with the tool. Using a practice video, students interacted with the video system and become comfortable with the tool.

All videos for the Early Childhood Study were taken directly from the Music Major Study so that participants in both studies observed the same classrooms and lessons. Control and experimental participants attended their first observation experience in the projected video environment (pretest). Once at the observation, students were given a copy of the paper-

based Multi-State Observation Form. Students watched the 45-minute video and used the final 10 minutes of class to complete the observation form. At the conclusion of the class, participants returned observation forms to the researcher.

During sessions two through nine, participants reported to either the control group (projected video in the classroom) or the experimental group (computer-mediated in the computer lab) as defined by their experimental condition. Students in both conditions were presented with the first 30 minutes of video and given an additional 5-10 minutes to complete observation forms. Students then engaged in a 10-minute group discussion about the observation experience.

Group discussions were led by a course instructor or the researcher within both treatment environments. Course instructors were used to facilitate the discussions whenever possible and these instructors were rotated between treatment environments to minimize the effect of a discussion facilitator upon a group's discussion. Participants were asked to (1) identify a significant event that was either positive or negative and explain why it was significant and (2) rate the observation on a scale of one through five and provided a rationale (Appendix G). All discussions were recorded and later transcribed for analysis.

At the conclusion of observations in both treatment conditions, completed observation forms were either printed (computer-mediated group) or turned in (live experience group) to the researcher. As requested by the course instructor, each question was graded using a check-minus, check, and check-plus rubric (Appendix H) and a grade was assigned to the observation form. All observation forms were graded and returned by the researcher to ensure consistency in grading. Written feedback was provided to any student if a question was not addressed or to request more reflection, effort, or detail.

Once the experimental and control groups completed session nine, students attended a live observation environment together for the posttest measure. In the same manner as the pretest, students were presented with the observation instrument and used the instrument during the projected video observation. At the conclusion of the observation, students were

given 10 minutes to complete the observation form before returning the observation form to the researcher.

The summative feedback and evaluation questionnaire was administered following the posttest measure. Individuals answered questions about their experience in observations and experience with the technology tool (if applicable). Participants were informed that their responses on the feedback and evaluation questionnaire had no affect on their course grade.

3.6 Qualitative Analysis

Qualitative data consisted of data from the summative survey, focus group interviews on the strengths and weaknesses of the online video tool, interview transcripts from Early Childhood group discussions, and discussion posts from online Music Major discussions. Data from the summative surveys that was coded for analysis included free-responses to questions about the advantages and disadvantages of treatment conditions, a description of satisfaction, and a concluding question that asked participants if "there [was] anything I have not asked you that would help me to better understand" the participant's experience (Appendix F). All free-responses were read and themes were developed based on an analysis of participant responses. Frequency counts were tallied to determine the frequency that an issue or theme was brought up as a strength or weakness of the participant's experience.

Early Childhood group discussions were analyzed and coded based on recommendations of grounded-theory research. In describing grounded-theory methods, Charmaz (2006) stated that "initial codes are provisional, comparative, and grounded in the data. They are provisional because you aim to remain open to other analytic possibilities and create codes that best fit the data that you have" (p. 48). The researcher first read through the transcripts and made notes about general ideas and themes present in the transcripts.

After checking with a qualitative researcher, it was determined that based upon the content of the transcripts and the focus of group discussions, student comments would be

coded as positive, negative/corrective, or comparative. It was also concluded that each complete thought about classroom instruction would be coded using the general designation. For example the comment *"I really liked how the teacher used transitions, it made the kids behave and also I liked how the teacher used the board to present instruction,"* would be coded as two separate complete thoughts with the "and also" used to separate the thoughts. The transcripts were then coded with a designation for broad category (P:, N:, C:) and a brief description was written of the contents of each code.

After an initial round of coding, 302 segments were coded as positive, 158 as negative/corrective, and 11 were coded as comparative. It was determined that each week's discussion and treatment environment represented a unique group of responses to a unique stimulus (classroom observation). Coded segments were grouped by treatment condition and the observation to which they referenced. A second round of coding attached categorical codes to these segment groups that referenced the topic or focus of the thought. Across observation discussions, 89 codes were generated for the computer-mediated group and 92 codes were generated for the projected video group.

Following the second round of coding, codes were analyzed and a description of each observation in each treatment environment was written. Charmaz (2006) advocated that:

> Memo-writing constitutes a crucial method in grounded theory because it prompts you to analyze your data and codes early in the research process. Writing successive memos throughout the research process keeps you involved in the analysis and helps you to increase the level of abstraction of your ideas. (p. 72)

From these memos, 13 broad themes were identified as being present in discussions across observations. To conduct an analysis of the difference between treatment conditions, the proportion of positive to corrective comments was compared as well as the content of group discussions in response to the same observation stimulus.

An analysis of music majors' online discussion posts revealed that student participation in online discussions was sporadic (less than 30% of required posts were completed). Additionally, the control group posted far more discussion posts (97) than did the experimental group (44). As a result of problems with the completion of postings, it was determined that the data was not complete enough to warrant an in-depth qualitative analysis. Therefore, the online discussion posts were only coded and organized for descriptive purposes in this research study.

3.7 Quantitative Analysis

A panel of raters was selected from reputational sampling. Two college faculty members, one graduate student, one former principal/band director, and one currently practicing choral director were selected to serve as raters of pretest and posttest data. At the beginning of the session, participants watched a video of the posttest observation and critiqued a sampling of student responses to the posttest observation. Interrater Reliability was computed by analyzing the number of agreements by the number of disagreements of pairs of raters (Boyle & Radocy, 1987).

After achieving an initial reliability rating of r=.33 using a 4 point rubric, it was determined that discrepancies in interpretations of the rubric caused disagreements among raters. The rubric was changed to a continuum of irrelevant, relevant, and detailed reflective. Questions one through nine were graded only as relevant or irrelevant responses as these were judged to be low-inference questions. Questions 10-22, were graded on a three dimensional scale (table 3.2). Raters then proceeded to rate the sampling of student responses using the new rubric and achieved a reliability rating of r=.82. Raters then rated the posttests, watched a video of the pretest observation, and rated the pretests using the same rubric.

Chapter 4

Results

The purposes of this study were: (a) to compare the effectiveness of computer-mediated video, projected video, and live observation on the lesson analysis skills gained in early music education field experiences. examine the effectiveness of computer-mediated observation on the development of lesson analysis skills; (b) determine the effects of student background, gender, and technology experience on observation experiences; (c) determine the qualitative differences between live and virtual field experiences; and, (d) to determine how the developed tool could be improved. This study used measures that included: (a) a demographic survey; (b) a pretest-posttest; (c) the capture of online discussions; (d) the capture of verbal discussions; (e) focus groups regarding the development and usefulness of the tool; and, (f) a summative survey about each participant's experience. This chapter is organized according to the research question addressed and the measure(s) that was/were used to address each research question.

4.1 What is the effect of computer-mediated video, projected video, or live experience on the development of lesson analysis skills in early music education field experiences?

Pretest and posttest measures were used to determine the effect of treatment condition on preservice lesson analysis skills. Four independent raters were selected based upon reputational sampling to score pre and posttests. Raters were chosen to represent a variety of backgrounds (college professor, graduate assistant field experience coordinator, former administrator, and an experienced public school music teacher). After watching videos of

the posttest field experience, raters scored an observation form that contained representative answers from multiple students. Trials and discussions were held until raters reached an agreement of r=.82 using the interrater reliability formula (Boyle & Radocy, 1987).

The following hypotheses were tested:

1. There will be no significant differences between groups on the pretest measure.
2. There will be significant differences between study treatment conditions on the posttest measure.
3. There will be significant differences between pretest to posttest scores within groups.
4. There will be significant differences between control and experimental groups on observation form subsets of instruction, classroom management, and pedagogical knowledge in both studies.

Based on a *t-test* comparison of means, the first hypothesis was accepted. There were no significant differences between treatment conditions in the music major study or the early childhood study (p>.05) on the pretest. A *t-test* analysis of posttest scores found no significant differences between treatment conditions in either the Music Major Study or the Early Childhood Study (p>.05) (table 4.1). Therefore, the second hypothesis could not be accepted.

Based on Cohen's (1998) suggestions about the determination of effect size for small sample studies, Cohen's D was calculated for both studies to determine the effect of treatment condition. While the effect size in the music major study was negligible (d=0.04), the effect size in the early childhood study (d=0.72) falls between Cohen's suggestions of a medium (d=0.5) to large effect size (d=0.8). This may reveal that given a larger sample size, statistically significant findings could be found favoring the projected video group over the computer-mediated group in the early childhood study.

An analysis of group mean scores for the pretest and posttest yielded diverse trends across the two studies. In the music major study, both the control and experimental groups

Table 4.1: Differences between groups on mean pretest and posttest scores.

Group	**Study**	**Pretest**	**Posttest**
Projected Video	Early Childhood	19.32	22.27
Computer-Mediated	Early Childhood	20.20	19.13
Live	Music Major	21.78	26.36
Computer-Mediated	Music Major	20.83	26.10

scored in a similar manner on the pretest and posttest (figure 4.1). Both of these groups significantly increased their score from the pretest to posttest measure ($p<.05$)(table 4.2).

Table 4.2: Pretest to posttest gain scores within groups.

Group	**Study**	**Gain Score**
Projected Video	Early Childhood	2.95*
Computer-Mediated	Early Childhood	-1.07
Live	Music Major	4.58*
Computer-Mediated	Music Major	5.27*

** significant difference at* p<*.05*

A graph of score change in the Early Childhood Study (figure 4.2) demonstrates an opposite trend from pretest to posttest between the two treatment groups. While the projected video group improved its score from the pretest to the posttest, the computer-mediated group slightly regressed. A *t-test* analysis of the change in scores found that the projected video group improved significantly ($p<.05$) from the pretest to the posttest while there was no significant difference in the early childhood computer-mediated group scores (table 4.2). Based on these findings the third hypothesis could be accepted for the Music Major Study

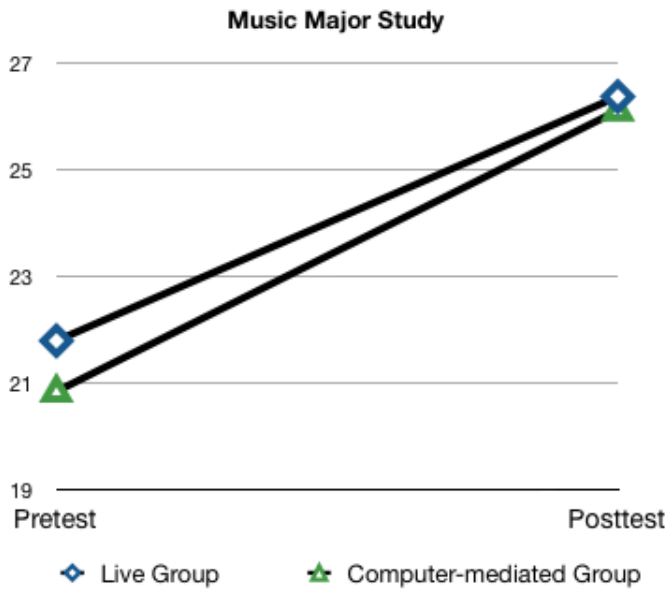

Figure 4.1: Music Major growth from pretest to posttest.

and the early childhood projected video group ($p<.05$). The hypothesis could not be fully accepted for the computer-mediated group in the Early Childhood Study.

The observation form contained groups of questions formed under the categories of Instruction, Classroom Management, and Knowledge of Content & Pedagogy. Scores under the subsection of Knowledge of Content & Pedagogy were not analyzed because only two questions referenced this subcategory. Therefore, the score range was not large enough to conduct a meaningful statistical analysis. Pretest and posttest scores under the categories of Instruction and Classroom Management were analyzed to determine if there was a significant difference between treatment groups on these subsections of the observation form. There was a significant difference ($p<.05$) between treatment groups on the Instruction score subset in the Early Childhood Study (table 4.3) but there were no significant differences between groups on the subset of Classroom Management scores (table 4.4) or among subsets in the music major study. Based on this finding, the fourth hypothesis was accepted for the instruc-

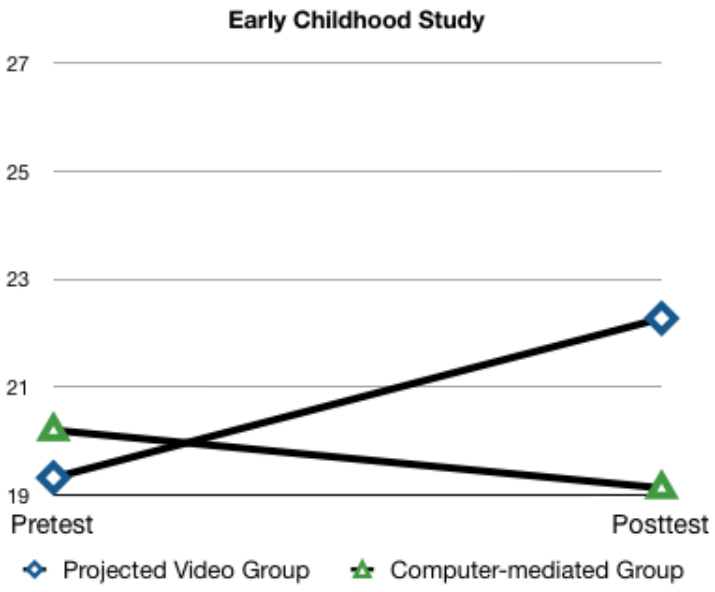

Figure 4.2: Early Childhood growth from pretest to posttest.

tion score subset for the Early Childhood Study, but could not be accepted for any other subset or for groups in the Music Major Study.

4.2 What effects do student background, gender, technology experience, and affective ratings have on field experience treatment conditions?

Participants completed a demographic survey and a summative experience survey to obtain factors that could be compared to pretest and posttest scores. Factors collected included age, gender, self-reported computer experience, prior participation in field experiences, desired occupation, year in school, self-reported impact of the study on the development of teaching knowledge, and experience satisfaction (table 4.5). Participants in the Music Major Study were predominantly juniors (74%), desired to become band or choral directors (74%), and had not participated in a prior field experience (64%). Participants in the Early Childhood Study were predominantly juniors (79%), desired to become an elementary teacher (89%), and had

Table 4.3: Differences between group scores within the subcategory of instruction on the pretest and posttest.

Group	**Study**	**Pretest**	**Posttest**
Projected Video	Early Childhood	12.16	13.63*
Computer-Mediated	Early Childhood	12.51	11.48*
Live	Music Major	13.58	16.17
Computer-Mediated	Music Major	12.73	16.07

** Significant difference between groups at p<.05*

participated in a prior field experience (67%). Within the construct of computer experience, early childhood majors were less confident in their computer abilities than music majors. Finally, music majors had a higher self-reported mean rating of experience satisfaction and impact on their knowledge of music teaching than did participants in the Early Childhood Study. The relationship of these variables to pretest and posttest scores was analyzed using stepwise regression analysis.

Within the Early Childhood Study no factor had a significant impact on pretest scores. The accumulated factors accounted for less than 25% of pretest score variance. However, on the posttest, the factors of group, prior field experience, and satisfaction accounted for 49.5% of posttest score variance. Treatment group (p=0.017) and the self-reported impact on knowledge about music teaching (p=.005) were significantly related to posttest scores. Participants who were in the projected video group or ranked the impact on knowledge most highly scored higher on the posttest measure.

In the Music Major Study, factors played an important role in the variance of pretest and posttest scores. Age, gender, computer experience, prior field experience, desired occupation, and year in school accounted for 57.3% of the variance in pretest scores. Factors of gender,

Table 4.4: Differences between group scores within the subcategory of classroom management on the pretest and posttest.

Group	**Study**	**Pretest**	**Posttest**
Projected Video	Early Childhood	5.69	6.75
Computer-Mediated	Early Childhood	5.86	5.98
Live	Music Major	6.42	7.81
Computer-Mediated	Music Major	6.30	7.75

No significant differences between groups

computer experience, and prior field experience were significantly ($p<.05$) related to pretest scores. Participants who were female, more confident about their computer experience, and had prior field experience scored higher on the pretest than other participants.

Music major factors of group, gender, desired occupation, prior field experience, impact on knowledge, and experience satisfaction accounted for 86.8% of the variance on posttest scores. Of these factors gender, impact on knowledge, and satisfaction were significant related ($p<0.05$) to posttest scores. Females, those who had prior field experience, and those who self-reported that the experience had an impact on their knowledge of music teaching scored higher on the posttest than other participants. Interestingly, participants who were more critical or unsatisfied with their experience scored higher than those who ranked satisfaction higher.

Table 4.5: Demographic data for the Music Major and Early Childhood studies.

Factor	**Music Major Study**	**Early Childhood Study**
Mean Age	21.53	20.54
Gender (M/F)	(11/8)	(3/25)
Major	Music Education (17) Music Performance (2)	Early Childhood (25) Business-related (3)
Year in School	Sophomore (0) Junior (14) Senior (2) Graduate (2) Transfer (1)	Sophomore (2) Junior (22) Senior (3) Graduate (0) Transfer (0)
Desired Occupation	Band Director (5) Choral Director (9) Orchestra Director (2) Elem. Music Teacher (1) Other Music Profession (2)	Elementary Teacher (25) Business-related Occ. (3)
Computer Experience	Inexperienced (1) Somewhat Experienced (6) Experienced (7) Advanced (5)	Inexperienced (1) Somewhat Exp.(10) Experienced (15) Advanced (2)
Prior Field Exp. Part.	7 (36%)	19 (67%)
Experience Satisfaction*	4.05	3.82
Impact on Knowledge*	4.05	3.68

**Self-reported indicators from the summative survey on a five-point Likert scale.*

4.3 What are the qualitative differences between live and virtual field experiences

An examination of the qualitative differences between live and virtual field experiences used a diverse array of self-reported measures, analysis of time spent on activities, and the analysis of student discourse. Data on student self-reported factors of effect on knowledge, experience satisfaction, and the perceived advantages and disadvantages of treatment condition were collected using a summative survey that was administered at the conclusion of the study. An analysis of student discourse was used to investigate how participants interpreted and conceptualized their experiences and their affective reactions to a diverse array of experiences.

4.4 Self-reported effect on knowledge about music teaching

Participants were asked to rate the extent to which field experiences in the course assisted them in developing their knowledge about music teaching. Respondents ranked this item on a five-point Likert scale. Respondents rated that the experience had a generally high impact on their knowledge about music teaching (table 4.6). Participants in the Music Major Study had a higher mean rating (4.04) than did participants in the Early Childhood Study (3.67). However a *t-test* between these two means found no significant differences.

Within both studies, the computer-mediated group had a higher mean rating for the effect of their experience on knowledge of music teaching than did the control group. The highest mean rating among all groups in both studies was given by the computer-mediated group in the Music Major Study. While these findings are interesting for descriptive purposes, no significant differences ($p>.05$) were found between groups.

Students were presented with 10 categorical aspects of instruction derived from the Multi-State Observation Form for ranking. These categorical aspects included teacher delivery, use of class time, instructional strategies, student engagement, planning objectives, motivational

Table 4.6: Self-reported impact of treatment condition on knowledge about music teaching.

Group	**Study**	**Rating**
Projected Video	Early Childhood	3.64
Computer-Mediated	Early Childhood	3.80
Live	Music Major	3.89
Computer-Mediated	Music Major	4.08

strategies, central concepts, assessment, classroom settings, and the use of resources. Participants were presented with the question, "Based on your experience in this research study, rank order these items according to how significantly this experience has contributed to your knowledge about these areas" (1- Most Significant Impact, 10- Least Significant Impact).

A comparison of the pooled ratings within each study (Music Major and Early Childhood), revealed that participants thought that field experience had a strong impact on their knowledge of *teacher delivery* and *use of strategies* (table 4.7).

Participants from the two studies differed on the ranking of *motivational strategies* and *use of class time*. *Motivational strategies* was ranked by participants in the Music Major Study as the second most significant impact whereas the participants in the Early Childhood Study ranked this item much lower (sixth most significant impact). *Use of class time* was ranked by participants in the Early Childhood Study as the second most significant impact, but participants in the Music Major Study marked it as only the eighth most significant impact. Participants from both studies rated *classroom settings and environments* as an item that was least affected by field experience (ninth for early childhood majors; tenth for music majors).

Table 4.7: Rankings of self-reported knowledge growth by music and early childhood majors.

Early Childhood	**Music Major**
1) Teacher Delivery	1) Teacher Delivery
2) Use of Class Time	2) Instructional Strategies
3) Instructional Strategies	3) Motivational Strategies
4) Student Engagement	4) Student Engagement
5) Planning Objectives	5) Use of Resources
6) Motivational Strategies	6) Assessment & Feedback
7) Central Concepts	7) Planning Objectives
8) Assessment & Feedback	8) Use of Class Time
9) Classroom Settings	9) Classroom Settings
10) Use of Resources	10) Central Concepts

Within the Music Major Study, the conditions varied by computer-mediated or live experience research treatment (table 4.8). Both treatment groups ranked their knowledge about the *use of class time* as one of the top two items to which field experience contributed in a significant manner (live, 1; computer-mediated 2). The two groups differed in the ranking of *planning & setting objectives* and *teacher delivery*. The live experience group ranked *planning & setting objectives* as the second most significant item whereas the computer-mediated group ranked this item eighth. *Teacher delivery* was ranked first by the computer-mediated group while the live experience group ranked this same item fifth.

Within the Early Childhood Study, conditions varied by computer-mediated or projected video experience (table 4.9). Both groups ranked field experience as having the most significant impact on their knowledge of *teacher delivery* (both groups ranked this first) and *use of strategies* (computer-mediated 2; projected video 3). The groups differed on the remaining item included among their top three items (computer-mediated participants included *student engagement* as number 3; projected video participants included *motivational strategies*

Table 4.8: Music major participant rankings of self-reported knowledge growth by treatment condition.

MM Live	**MM Computer-Mediated**
1) Use of Class Time	1) Teacher Delivery
2) Planning Objectives	2) Use of Class Time
3) Student Engagement	3) Instructional Strategies
4) Instructional Strategies	4) Motivational Strategies
5) Teacher Delivery	5) Student Engagement
6) Central Concepts	6) Use of Resources
7) Motivational Strategies	7) Central Concepts
8) Classroom Settings	8) Planning Objectives
9) Use of Resources	9) Assessment & Feedback
10) Assessment & Feedback	10) Classroom Settings

as number 2). Items that were least affected by field experience for the early childhood computer-mediated group were *planning & setting objectives* (8), *use of classroom time* (9), and *central musical concepts & processes* (10). Items that were least affected by field experience for the projected video group were *assessment* (8), *use of class time* (9), and *classroom settings and environments* (10).

A comparison across both studies revealed a discrepancy on the ranking of teacher delivery. Across three treatment groups in the two studies, *teacher delivery* was the number one ranked item. The one outlier was the live observation group in the Music Major Study. Instead of ranking *teacher delivery* as the most significant impact item, this item was ranked fifth.

4.5 Differences in use of time in the music major study

Data was gathered on the amount of time that it took participants to complete observations and observation forms. One observation was removed from the analysis of time spent because

Table 4.9: Early childhood participant rankings of self-reported knowledge growth by treatment condition.

EC Projected Video	**EC Computer-Mediated**
1) Teacher Delivery	1) Teacher Delivery
2) Motivational Strategies	2) Instructional Strategies
3) Instructional Strategies	3) Student Engagement
4) Planning Objectives	4) Motivational Strategies
5) Use of Resources	5) Assessment & Feedback
6) Student Engagement	6) Use of Resources
7) Central Concepts	7) Classroom Settings
8) Assessment & Feedback	8) Planning Objectives
9) Use of Class Time	9) Use of Class Time
10) Classroom Settings	10) Central Concepts

the video taken from this observation was only 16 minutes long due to technical problems. With this observation removed from time analysis, the mean length of observed lessons was 46 minutes (table 4.10). Students in the live experience group were asked to estimate the amount of time that they spent filling out observation forms outside of the observation environment. Live experience students spent a mean time of 40 minutes outside of class and the observation environment to complete observation forms. Thus, without factoring travel time, students spent an average of 1 hour and 26 minutes on observations per week.

The software used by the computer-mediated groups automatically calculated and stored the total amount of time spent on each observation as a part of the logout procedure. The mean amount of time spent by music majors in the computer group was 59 minutes. When it is taken into account that the live experience group also spent an average travel time of 60 minutes to travel an average distance of 60.8 miles, the live experience group spent much more time on field experience observations than did the computer group.

Table 4.10: Time spent on activities.

Mean	**Live Group**	**Computer Group**
Observation Time/Week	0:46	0:59
Time Outside of Class/Week	0:40	0:00
Travel Time/Week	1:01	0:00
Total	2:27	0:59

Participants in the early childhood groups spent an identical amount of time in observations and completing observation forms because of classroom time constraints. During the treatment period, participants in both groups watched the first 30 minutes of classroom teaching and were given an additional 5 to 10 minutes to complete observation forms. Groups then engaged in approximately 10 minutes of group discussion.

4.6 Advantages and disadvantages of treatment condition

Participants offered responses to the advantages and disadvantages of their particular treatment condition. A categorical analysis of responses revealed that the most frequently cited advantages of live experience included the tangible and holistic experience (8) and the ability to have personal interactions with the teacher (5) (table 4.11). Regarding the tangible and holistic experience, a participant said:

> Being able to see the direct student response to lessons, the ability to see the teacher live and interacting with the students personally, the really classroom setting and feeling of a school [are advantages of the live experience condition].

In this field experience, a few of the teachers took the time before their lessons to talk to the participants about their class and the upcoming lesson. Eight participants identified this in their comments as a strength of live experience.

Table 4.11: Advantages and disadvantages cited by participants in the Music Major Study.

Live				**Computer-Mediated**			
Advantages		Disadvantages		Advantages		Disadvantages	
Tangible/holistic experience	(8)	Travel	(5)	Control of Events /Playback	(9)	Viewable limitations	(8)
Interaction with teacher	(5)	Distraction to Students	(5)	Comfort of the experience	(4)	Can't see students	(6)
More attentive	(2)	Resource commitment	(4)	Computer entry	(3)	Inability to sense setting and place	(3)
None	(1)	Unable to pause teaching	(1)	Analysis during event	(3)	Audio limitations	(3)
				Distanced observer	(2)	Value of 'real experience'	(3)
				Resource Commitment	(4)		

4.6.1 Live experience advantages/disadvantages

Participants in the live experience condition most frequently cited travel (5), their impact on the classroom (5), and resource commitments of time and money (4) as disadvantages of live field experience. A participant stated:

> It takes a lot of time and gas money. Sometimes there was not really enough space in the classroom for all of us to sit. It was often uncomfortable. Also, the students (and teachers for that matter) may have behaved and acted differently since we were watching.

Regarding the observers' impact on the classroom, another student reflected, "we also inhibit students - especially the young ones - who are intimidated by older kids or large groups. They may not perform the same as if we weren't there."

Time and and monetary resource allocation were frequently cited as disadvantages of live experience. During the course of the study gas prices fluctuated between two and four dollars a gallon. Following a hurricane in the Gulf Coast, gas supplies temporarily became scarce in the area. Therefore, the recognition of resource commitment may have been strongly influenced by these contextual factors.

4.6.2 Computer-mediated experience advantages/disadvantages

Among computer-mediated groups in the Music Major and the Early Childhood Studies (tables 4.11, 4.12), participants frequently cited control over video playback (9 Early Childhood; 9 Music Major) as an advantage of watching field experiences using computers. A music major stated, "The video allows you to pause and rewind, which allows you to compare teachers and teaching strategies, as well as watch the teacher several times while focusing on a different aspect of teaching." In a similar manner, an early childhood major commented:

> I liked the computer-video observation because it enabled you to navigate through the video and find exactly what you're looking for. I liked being able to pause so that I could write down exactly what I wanted to and in the detail that I wanted to, and not miss any of the video. I also liked that I was able to rewind if I felt like I missed something or didn't understand something.

The ability to stop, start, and re-watch events appeared to be the most commonly perceived advantage of computer-based video.

After control of video playback, participants in the music major computer-mediated group cited the comfort of the experience (4), in-event analysis (3), and computer entry (3) as advantages of computer-mediated video. Participants seemed pleased that they could critique and analyze teaching in a detached manner in the safe surroundings of a computer lab. Regarding the self-paced comfort of the experience, one student remarked that they could work on their own time, really "invest in the experience," and can pause and reflect while observing.

Table 4.12: Advantages and disadvantages cited by participants in the early childhood major study.

Projected Video				**Computer-Mediated**			
Advantages		Disadvantages		Advantages		Disadvantages	
Group interaction	(5)	None	(4)	Control over playback/self pacing	(9)	Size of viewable area	(4)
None	(2)	Use of time	(2)	Diversity of experiences	(1)	Navigation of questions	(4)
Distanced observer	(2)	Attention	(2)	Video proximity to questions	(1)	Answer checking	(3)
Viewable Size	(2)	Cannot see student reactions	(1)	Navigation of questions	(1)	Technical problems	(2)
Reality of experience	(2)	Freedom of thought	(1)			Usability comfort	(1)
						Computer entry	(1)
						Time Demands	(1)
						None	(1)

Music majors who cited computer entry as an advantage, stated that they were more comfortable typing their answers because of the speed of execution and the flexibility to extend an answer beyond the spatial limitations of a prescribed answer space on a paper-based evaluation form. This perceived advantage of computer-mediated video was echoed among five early childhood respondents. However, this feeling may not be universal, as one early childhood major regarded typing responses into the computer as a disadvantage of computer-mediated observation.

After citing control of playback and computer entry as the top two advantages of computer-mediated video, early childhood majors also cited proximity of the video to the questions (1), diversity of observation experiences (1), and navigation of questions (1) as advantages. A participant noticed the focus of visual attention as a difference between

computer and live experiences stating, "I did like that the video on the computer was next to the questions so I didn't feel that my eyes were completely off of the video like I did when I watched the last video on the video and had to put my observations on paper."

Music major and early childhood computer-mediated groups were similar in the most frequently cited disadvantage of computer-mediated video but differed on other points. Both groups cited the camera's field of view as a limitation of video-based field experiences (Music Major 8; Early Childhood 4). Respondents who wrote about limitations of the field of view cited problems attending to the most important sounds in a classroom. One participant stated:

> I wasn't able to observe any of students' reaction and how they are engaged in the class with their teacher. I wish we had multiple cameras capturing the sides of students and teachers. Sometimes, the recording of video wasn't good so that I couldn't hear what the teachers were talking.

Video zoom in and out and microphone placements were strictly controlled for the purposes of this study. This control may have created limitations in video quality.

Other disadvantages cited by the music major computer-mediated group included subcategories of viewable limitations including the inability to attend to student responses (6) and fully sense classroom dynamics and layout (3). One subject stated:

> It is very hard to make assessments when you can hardly see the students. Yes, teaching is about the subject matter and delivery, etc, but the reason we do it is the students. This is an incredibly important factor that we missed out on.

Another disadvantage cited by three individuals was the fact that video experience is not as exciting, engaging, or memorable as "real-life" experience.

Participants in the early childhood computer-mediated group cited technical problems (2) and a dislike of the answer checking mechanism (3) as experience disadvantages. The answer checking mechanism produced strong opinions from respondents in the disadvantage

question. One participant stated that he/she was frustrated with regard to the judgment of answers as correct and incorrect. She believed that "[observation] is an opinionated critique and there is no right or wrong."

4.6.3 Projected video experience advantages/disadvantages

Early childhood participants in the projected video group cited group interaction (5) and the opportunity to observe classroom practices in action (3) as advantages of their experience (table 4.12). Regarding group interaction, one participant said:

> I believe the video group had an advantage because we got to discuss out loud what we liked and disliked about the lessons and what worked and did not work. It made me consider things I would not have if I had not thought about them if someone else had not suggested them.

Other advantages mentioned included the opportunity to observe from a distance (2), the size of the viewable screen (2), and the "real" nature of the experience (2). Students who commented on these advantages indicated that the large-screen classroom setting gave the experience a distanced nature that allowed for freedom of opinion. This "distanced" experience simultaneously felt real and authentic because of the reality of the video clips and the viewable setting.

The most prominent disadvantage cited by the projected video group was that of video and audio quality (4). Students most specifically cited problems in the quality of audio and the ability to pick up every word that a teacher or student says as a weakness of the video experience. Projected video participants cited problems of video and audio quality rather than limitations of viewable area (cited by computer-mediated groups) as a disadvantage of treatment condition. Other cited disadvantages included the limited ability to watch student reactions (1), the use of classroom time (2), the divided attention resulting from filling out a form while watching the video (2), and freedom of thought within a group setting (1).

Participants in all groups tended to write of advantages and disadvantages in comparison to the other known treatment. Therefore, music majors often responded to the advantages and disadvantages question by comparing their experience against that of the other music major group. Early childhood majors did likewise in comparing their experience against the experience of the other early childhood group.

4.7 Satisfaction with experience

Participants were asked to respond to the prompt, "To what extent were you happy with the experience that you had" with 1 being "very dissatisfied" and 5 being "very satisfied" on a 5 point scale. The music major computer-mediated group had the highest mean satisfaction rating of 4.18 (figure 4.3). Next, in descending order of mean satisfaction were the music major live experience group (3.89), the early childhood video group (3.86), and the early childhood computer group (3.8).

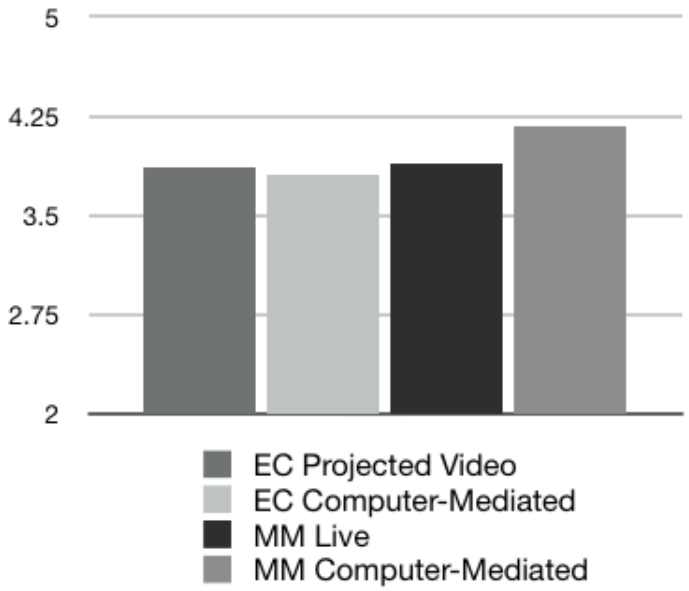

Figure 4.3: Self-reported satisfaction ranking across treatment condition.

Participants were invited to submit comments about their satisfaction if they desired. Across experimental conditions comments, student satisfaction with the opportunity to learn from real-world classrooms emerged as the dominant satisfaction theme. One student wrote:

> I felt that it was good for me to see as a future teacher how to better interact with students. I was able to see (what I thought to be) good and not so good teachers. By using the observation form, I was able to pin-point what it was about the teachers I liked or disliked, and what I thought made them effective teachers. In turn, I'll be able to apply that to myself and analyze myself critically as a teacher.

Students frequently cited the ability to see different classroom strategies in action and the opportunity to see how these strategies did or did not work in the classroom.

Other themes emerged by treatment group. Those groups who watched the classroom either via computer-mediated video or projected video cited problems with video and audio quality as a factor in their satisfaction ranking. Participants in the live experience and projected video group commented negatively on observation form length or how this form divided attention in observations. One student stated:

> I thought that the types of questions on the evaluation sheet was somewhat of a teaching scavenger hunt to try and catch things that the teacher did well or not. I think I could have learned a lot more by journaling about what I observed. This way I could pay full attention to how the teacher was instructing instead of making sure I catch that one time the teacher uses a motivational strategy.

The degree to which observations are structured as being helpful or not helpful remained a point of disagreement among participants.

As the final question on the summative questionnaire form, participants were asked "Is there anything that I have not asked you that would help me to better understand what you feel to be the strengths or weaknesses of your participation in field experience this

semester?" The majority of respondents indicated that they were able to adequately depict how they felt about the experience in the summative questionnaire form. One live experience participant criticized the lack of diversity in field experience sites. This participant cited that the group was not able to visit an orchestra, see a male elementary teacher, or a female band director. Two participants in the computer-mediated group advocated using the technology in tandem with live experience. This would allow participants to have the benefit of experiential aspects of live experience with the analysis tools provided by the computer-mediated video environment.

4.8 Early childhood discourse

At the end of each treatment session of the Early Childhood Study, participants took 10 minutes to discuss observations. Group discussions were guided by a facilitator who followed a discussion protocol (Appendix G). Participants were asked to name one significant positive or negative event, discuss that event, to rate the overall lesson on a scale of one through 5, and to provide a rationale for their rating. Discussions were recorded and transcribed during seven treatment sessions. [1]

4.8.1 Analysis by Affective Response

Participant discussions were first analyzed and coded for broad categories of positive, corrective/negative, and comparative. Statements were categorized as positive when a participant stated that they "liked" a lesson or gave an explanation about why a certain practice or lesson was effective. Conversely, corrective/negative comments were coded as such when a comment indicated dislike or suggestions for improvement. Comparative comments were those that compared observation experiences but did not attach a value judgment.

The projected video group had a higher proportion of positive comments (54%) than the computer-mediated group (45%) (table 4.13). Individual observations were analyzed to

[1] During the eighth observation, no discussion took place at the instructor's request.

determine which observation conversations were dominantly positive or corrective/negative (table 4.14). Computer-mediated and projected video groups displayed the same affective tendencies in six of seven observations. In observations of elementary classrooms (3 & 9) and an observation of bands (5 & 7), groups had a greater proportion of positive comments than corrective comments. Both groups had dominantly corrective/negative conversations in observations of two chorus classrooms (>58%). In observation four (band observation), the control and experimental groups were opposite in affective responses. In this observation, the projected video group was dominantly positive in their responses while the computer-mediated group was dominantly corrective/negative.

Table 4.13: Frequency of Early Childhood Comments Across Broad Categories.

	Positive	**Corrective/Negative**	**Comparative**
Computer-Mediated	138	89	6
Projected Video	164	69	5
Total	302	158	11

Three observations to which groups had dominantly positive affective responses included both elementary observations (5th grade and Kindergarten) and an observation of a high school band class. Table 4.15 presents the dominant themes of the treatment groups as they discussed each observation.

Across both groups, themes of teacher demeanor and activity diversity were frequently cited as a rationale for why lessons were effective. Participants frequently spoke of a teacher's enthusiasm, positive attitude, or of seeing that "he wants to be there." Regarding the elementary teacher, a participant noted that, "he acted like he wanted to be there . . . he really has a passion [for] working with children." Both groups also noticed the diversity of activities, "[they did] a bunch of different things . . . she just kept changing it up."

It should also be noted that the effect of a lesson on students was a positive theme that emerged across various positive oriented discussions. Discussions aimed at student attention, engagement, and effect all referenced the idea that students were either attentive, on-task,

Table 4.14: Comparison of the general tendencies of positive and corrective comment proportions

Observation	**Computer Group** (Positive/Negative)	**Video Group**
(1) Pretest	No Discussion	No Discussion
(2) HS Chorus	Negative (26.1% / 73.9%)	Negative (36.7% / 63.3%)
(3) 5th Grade Music	Positive (75.9% / 24.1%)	Negative (85.7% / 14.3%)
(4) HS Band A	Negative (45.8% / 54.2%)	Positive (82.1% / 17.9%)
(5) 7th Grade Band	Positive (54.1% / 45.9%)	Positive (74.1% / 25.9%)
(6) 7th Grade Chorus	Negative (34.2% / 65.8%)	Negative (41.5% / 58.5%)
(7) HS Band B	Positive (79.6% / 20.4%)	Positive (77.5% / 22.5%)
(8) 8th Grade Band	No Discussion	No Discussion
(9) Kindergarten Music	Positive (100% / 0%)	Positive (97.4% / 2.6%)
(10) Posttest	No Discussion	No Discussion

Table 4.15: Dominant themes from discussions where both groups were dominantly positive

Observation	**Projected Video (PV)**	**Computer-Mediated Video (CMV)**
(3) 5th Grade Music	1) Diverse Activities 2) Form Game (4) 3) Teacher Questioning & Instructions (4) 4) Arrangement (3)	1) Diverse Activities 2) Student Attention 3) Form Game (3)
(7) HS Band B	1) Teacher Demeanor (7) 2) Student Effect (3) 3) Delivery (3) 4) Efficiency (3) 5) Teacher Responsiveness (3)	1) Teacher Demeanor (7) 2) Student Effect (5) 3) Engagement (4) 4) Teacher Feedback (5) 5) Teacher Responsiveness (3) 6) Objective (3)
(9) Kindergarten Music	1) Teacher Demeanor (9) 2) Delivery (10) 3) Classroom Management (3) 4) Student Effect (3) 5) Steady Beat Activity (3)	1) Teacher Demeanor (6) 2) Diversity of Activities (3) 3) Classroom Management (3)

remembered information, or seemed to enjoy being present in the classroom. In the 5th grade observation, a participant noted the impact of a lesson on student attentiveness: "she was keeping their attention and they weren't really acting up or anything."

In the 7th grade middle school band observation, participants often overlooked complaints about not being able to hear the teacher and formed positive perceptions based on the effect of the lesson on student engagement. One participant suggested that the teacher's soft-spoken nature may give strong evidence about his ability to keep students engaged. The participant said, "[the] fact that he talked quietly was annoying to us, but it was good because it showed that he didn't have to yell to get their attention."

Observations of two chorus classrooms had a dominant corrective/negative orientation across both treatment conditions. Themes from the dominant corrective/negative orientation were focused on different elements of the observation experience across the two observations (table 4.16). In the high school chorus observation, both groups focused on the absence of a well-defined objective as a significant corrective issue. Participants shared that they knew little about what the objective was: "I assume they knew what they were . . . learning, but I didn't."

Table 4.16: Corrective/Negative themes across dominantly corrective/negative observations.

	Projected Video (PV)	**Computer-Mediated Video (CMV)**
HS Chorus	1) Absence of well-defined objective (12)	1) Listening Activity: teacher guidance (7) 2) Absence of well-defined objective (5) 3) Classroom Management (3)
7th Grade MS Chorus	1) Teacher demeanor (10) 2) Teacher feedback (7) 3) Student Fear (4)	1) Teacher demeanor (8) 2) Group Testing (4) 3) Feedback (3)

Participants focused on the teacher's demeanor and the absence of feedback as major corrective/negative issues in the 7th grade middle school chorus observation. Participants cited that the teacher could have been more encouraging, enthusiastic, and should have acted "like she wants to be there." According to participants, the teacher failed to move around to the students, interact, and provide feedback during a group work activity. Participants also noted that during a group test and run-through of concert music, the teacher continued to provide little to no feedback.

The two treatment groups were divergent in their affective response to a band observation. As noted earlier in table 4.14, the projected video group was dominantly positive in their responses to the observation while the computer-mediated group was dominantly corrective. The majority of the projected video group's positive oriented discussions focused on the effect of the lesson on students and the use of specific strategies within a band warm-up period (table 4.17). Regarding the effect of the high school band lesson on students, participants noted that the students seemed engaged and responded well to his "feedback and everything that he said . . . he was just a good teacher."

Table 4.17: Positive themes across a divergent observation.

Observation	**Projected Video (PV)**	**Computer-Mediated Video (CMV)**
High School Band A	1) Student Engagement and Respect (4) 2) Diverse Strategies during the warm-up (4) 3) Feedback (4)	1) Student Respect (3)

In this observation, participants from both treatment groups recognized changing tempos, problem isolation, repetition, and tuning strategies as different effective instructional strategies. However, an analysis of corrective comments from the computer-mediated group revealed that some early childhood participants were unable to see variation in strategies

or felt that there was not enough variation within these activities (table 4.18). A frustrated student from the computer-mediated group stated:

> I thought it was hard to follow along, because I don't know anything about any of this and they just practice a lot, so I would kind of wait to hear what he would say and then they would practice again. I didn't really get a lot out of this.

While not as prevalent, corrective comments were echoed within the projected video environment about the diversity of the warm-up: "It seemed to me like they just kept doing the same thing over and over again."

Table 4.18: Corrective themes across divergent observations.

Observation	**Projected Video (PV)**	**Computer-Mediated Video (CMV)**
High School Band A	1) Warm-up strategies(2)	1) Absence of objective (4) 2) Warm-up strategies (3)

As was previously mentioned in participants' corrective comments about the high school chorus class, participants once again focused on the absence of a well-defined objective in the high school band class. Participants cited that while they saw an essential question at the beginning of class, they were confused about what the clear presentation of an objective would look like in a high school classroom. A participant shared, "I was just confused, they showed the picture [essential question] up on the board ... I was confused, were they practicing for a concert or was there an objective really?"

4.8.2 Analysis by Themes

Comments were also coded for thematic analysis to determine the issues and topics that participants approached in field experience conversations. Participants focused on aspects of the teacher, qualities of the lesson, and the effect of the lesson on student interest, engagement,

and behavior. Major thematic categories that emerged about the teacher included classroom management, demeanor, feedback, expectations, and delivery (table 4.19).

Table 4.19: Teacher-focused themes.

Theme	**Frequency**	**Num. of Observations**
Demeanor	56	6
Delivery	55	7
Feedback	34	5
Classroom Management	30	6
Expectations	12	4
Competence	7	2

Teacher demeanor

Teacher demeanor emerged as the single largest teacher-related thematic category with a total of 57 comments from six of seven observations. Participants commented on teacher demeanor as both a positive (33) and negative (23) aspect of a teacher's practice. Thematic categories of teacher demeanor included teacher energy, "fun" disposition, teacher interaction, teacher passion, and teacher politeness.

Within the category of teacher energy, participants resonated with active, energetic, and engaging teaching and were repelled by teaching that "lacked motivation" or enthusiasm. All but one of the nine comments about teaching that lacked motivation or enthusiasm were focused on the same observation experience. Participants described this teacher as needing "more enthusiasm" and needing to be "more engaging." In a likewise manner, eight of ten comments about a teacher's energetic demeanor came from the last observation experience (ob. 9). Regarding this observation, a participant commented, "he didn't slow down at any point and I think the kids really responded well."

Participants spoke of a teacher's demeanor in broad terms of a teacher being "fun" or using a sense of humor to develop a positive learning environment. Regarding an event in a band classroom, a student said:

> There was this part where [a student] was playing a little solo thing [and] everyone started to mess up and started laughing and the teacher started to laugh, I thought this was kind of cool, it shows that he has personality and people really like him.

The broad idea of "fun" was also cited in a negative way; one teacher was regarded as "clearly the least fun teacher I have ever seen." While simply describing a practice as "fun" may not be encouraging to teacher educators, this thematic category may demonstrate that participants continued to see observations as students and not as preservice teachers.

Participants also discussed the positive and negative qualities of how teachers interacted with students as an aspect of a teacher's demeanor. Practices that were cited as poor examples of interaction included practices that were "too introverted" and lacked encouragement. Students also noted a teacher's movement or lack of movement around a classroom as an element of a teacher's interaction. Instead of "sitting in a chair saying students do this, students do that," a teacher should move around the room and encourage students.

Students responded positively to the teacher-student interactions in one band classroom as exemplifying a strong respectful quality of a teacher's demeanor. The teacher "gave compliments a lot, he always asked are you ready to play please, he was really polite, but he still has [their] respect . . . I mean, I would have enjoyed that class." This quote responded to the positive impact of politeness but also perceived politeness from the perspective of being a student in that class ("I would have enjoyed that class").

Teacher delivery

Teacher delivery was the second strongest thematic category among student discussions. Within teacher delivery, participants spoke of teacher guidance, organization, transitions and pacing, and qualities of the teacher's voice. Participants responded most positively to teacher guidance that clearly stated "what everybody needed to be doing" and was adapted towards the students' developmental level. Regarding the kindergarten observation, a participant

commented that the teacher's delivery was strong because the teacher "knew his audience, he knew how to respond and act towards kindergartners."

Comments directed at a teacher's organization, transitions, and pacing often referred to the "smooth[ness]" of a teacher's delivery and the use of procedures for lesson tasks. Participants reflected that good pacing kept students' attention and was responsive to students' needs. A participant noted, "he sped [the students] up, when he thought that they got it ... he would slow them down [when they didn't get it], so I think he was pretty good in keeping with their abilities." When a teacher was able to keep students' "attention the entire time, it was because he moved so quickly through things, they didn't get bored."

With a frequency count of 21, a teacher's voice was a major sub-theme of delivery across two observation experiences. In the first observation experience, participants espoused frustration over the volume of the teacher's voice. The problem of the teacher's voice was generated from the combined problems of a quiet teacher, a loud air conditioner, and the limitations of video audio to respond to these two conditions. One participant compared her observation experience with her own experience as a student:

> I have an entomology class, and the guy puts the microphone [on] for the lecture, puts the microphone too far away from his mouth, so I can't, sometimes its really hard to hear, he has some really cool things to say ... I get so frustrated, I think you do miss things.

Many participants cited that even after recognizing the fact that the video amplified problems of the teacher's voice, they still felt that the volume of the teacher's voice was a strong concern.

In the observation of a kindergarten classroom participants responded positively to how the teacher modulated the pitch of his voice and used his voice to keep students' attention. A participant stated, "I liked how he changed his voice, he did different voices, funny voices. Not so much to be goofy but really to get the students' attention ... and that was really

good." Another participant noted how quickly the teacher was able to change from a playful voice to one that had more authority to handle a classroom management issue.

Teacher feedback

Within the broad thematic category of teacher feedback, students spoke of the constructive, encouraging, specific, and responsive natures of feedback. Participants resonated with practices that were encouraging to the students and focused on the correction and reinforcement of student responses rather than "calling out" students in a public manner. Participants also engaged in conversations that revealed the importance of specific feedback that was responsive to student performances. Regarding themes of the specific and responsive nature of feedback, most participants' comments referenced the same band observation. In this observation the teacher "specifically pointed out" aspects of performance that needed improvement.

Participants used the same categories of constructive, encouraging, specific, and responsive feedback to describe practices that participants saw as less than desirable. One participant compared her own experience in chorus with that of the observation:

> I took chorus in high school and middle school and usually when you were doing stuff in between songs there's like "Oh good job" or "you need to fix this right here." ... [But in this observation] she had no feedback whatsoever, even if it was perfect ... [She] didn't give confirmation on whether it was good or not.

In this particular observation, the lack of feedback was a strong negative theme across treatment conditions.

Classroom management

Within classroom management, the major thematic concepts included teacher authority, comparisons of good and poor structure, efficiency, and the effect of classroom management practices. Across five of six observations, participants spoke of a teacher's authority and their ability to clearly communicate expectations. A participant noted, "[she] established very clearly that she was the teacher in the classroom ... the students were very respectful

to her . . . [and] really listened to her . . . she had good classroom management skills." These comments frequently used the words "control," "establish," "authority," or "command." Participants indicated that strong teaching was that in which an authority figure was clearly visible in the classroom.

Throughout observations, participants dialogued about classroom structure and the effect of strong or weak classroom structure. The very first observation of the treatment cycle began conversations on a classroom management structure that was seen as being a "little too relaxed." In this classroom, "there was no hand raising . . . calling on people and it was just everybody talk and everybody did what they wanted to do, it was hard for me . . . I need more structure in it [the lesson]."

Participants spoke of strong structure as having an effect on on-task behavior and efficiency. In the 7th grade choral classroom, students spoke of how the teacher was "really strict" and "not that friendly." Despite these connotations, participants claimed that the practice worked because the middle school students were on-task. This same classroom experience inspired a strong discussion within the projected video group among participants who thought that she was so strict that "they were afraid of her." Many participants in this group seemed to feel very strongly that this was a major flaw in the teacher's demeanor.

The final observation stimulated conversations about the efficiency of classroom management. When the teacher corrected students in this class, he "did it really fast [and] he didn't dwell on it." One participant engaged in a long dialogue about a particular student who was acting out and how the teacher used proximity as an efficient and positive practice.

Expectations

The thematic category of expectations was used to code responses that focused on a teacher's communication of standards and the use of high or low expectations from an organized approach to teaching. Students responded positively with practices where a teacher's short verbal prompts generated student behavioral responses. Students recognized that many

of the teacher's expectations in strong observation experiences had been developed prior to the observation.

Teacher competence

Teacher competence was only cited in participant discussions across two observations. All comments on teacher competence referenced a positive aspect of a teacher who "knew what he was doing." Students cited that competence indicators included the ability to present content at an appropriate developmental level, present a lesson without referring to notes on the board, and to have a thorough knowledge of fingerings and instrumental techniques. The paucity of comments on teacher competence may reveal that this aspect of teaching was difficult for participants to ascertain either because of the participants' prior knowledge or the structure of the field experience.

4.8.3 Analysis by themes: Lesson-focused themes

Major thematic categories that emerged about qualities of the lesson included the presence of a well-defined objective, use of resources, use of prior and interdisciplinary knowledge, lesson efficiency, and the diversity of strategies (table 4.20). The largest and most dominant coding category was the category of strategies. Participants most often commented on practices that used diverse strategies, modeling, journaling activities, and strategies related to ensemble warm-ups. Across six of seven observations, participants commented on either a sufficient or insufficient diversity of strategies. In both elementary lessons, participants were easily able to pull apart the diverse strategies that were used to support the central objective. A participant stated, the teacher "gave multiple representations of content in this video [on] expression, he didn't just tell them the definitions and give them a bunch of songs . . . he played the guitar [and] used speech to model expression."

Classroom strategies

An interesting contrast emerged with ensemble warm-ups among participant comments. While some early childhood participants segmented the warm-up into different and diverse

Table 4.20: Lesson-focused themes.

Theme	**Frequency**	**# of Observations**
Strategies	117	7
Objective	41	7
Knowledge Integration	12	6
Efficiency	12	3
Arrangement	9	1
Resources	5	2

strategies, others saw the entire warm-up period as one entity. Participants who saw warm-up as one entity most often made comments about the lack of strategy diversity in the observed lesson. These participants made comments that included statements such as: "I just thought the whole class was the same thing the whole time" and "it just seemed like they just kept doing the same thing over and over again."

Related to the segmentation of strategies, participants engaged in conversations across observation experiences as to the differences between elementary and secondary observations. A participant noted:

> [The elementary observation] was easier for me to see, because he was teaching kindergartners so he has to teach it in a different manner where it's easy to pick out every little thing that he's doing, versus . . . a high school band class [where] . . . its hard for me.

Participants commented that making comparisons between elementary and secondary observations was difficult because they were "totally different classroom[s] altogether."

The two more specific strategies that participants noticed and commented on were the use of modeling and journaling. Participants stated that modeling provided students with a

clear concept and goal. Journaling was cited as providing students with an opportunity to creatively respond to music in a way that integrated language arts and history.

Other specific strategies from participant discussions included the use of a television to provide announcements, a token-reward behavior strategy, a form game, group work and group testing, a steady-beat movement activity, and counting, balance, and airflow exercises. Across these activities, participants most frequently resonated with activities that provided visual assessments of student progress (form game and beat activity), were efficient (televised announcements), and allowed for social interaction (group work) and problem solving (group work, balance, and counting exercises). Strategies were also identified as strong when participants believed that the strategies had an effect on students' behavior or performance (token reward system and number exercise). Problematic aspects of strategies that were most often cited included problems of fairness (group testing and token-reward behavior strategy) and the negative impact of a strategy that singled out a student (group testing and token-reward behavior strategy).

Objectives

Twelve out of 16 comments about objectives focused on the absence of an objective. All comments about the absence of a connection between activities and the objective and a majority of comments about the presence of an objective emerged from discussions of a high school choral observation experience (observation 2). At the very best, a teacher "did a really good job of telling them exactly what they were going to do . . . it's really organized and easy to follow." At the most critical level, a teacher "should explain the lesson at the beginning . . . she just jumped in and decided, lets waste time and sing random things."

Integration of Knowledge

Participants focused on the integration of prior knowledge when such a practice was present. They also focused on the integration of knowledge from diverse subject areas regardless of the presence of that practice in a field experience. Comments regarding prior learning were situated in response to the kindergarten observation. In this observation, the teacher

reviewed and integrated a previous lesson on timbre. In the 5th grade observation, participants noted how the teacher integrated history about the march genre into a discussion of form. In three other observations, participants made comments about the absence of interdisciplinary integration.

Efficiency

Participant comments regarding efficiency were coded as either focusing on the on-task nature of a classroom or the structure of classroom procedures. Across three different observation experiences, participants noted on-task teachers and students as a positive aspect of a classroom observation. Comments under the category of procedures identified routines and transitions that added or decreased the efficiency of a classroom. Strategies that were cited as adding efficiency were automated and generated little interruption to the on-task nature of the classroom. Those that decreased efficiency were cited as contributing to classroom management problems.

Resource use and classroom arrangement

Two minor categorical themes included the use of resources and the arrangement of the classroom. All but one comment on the use of resources and all comments on classroom arrangement were made in response to the same 5th grade observation. Participants commented on the use of resources only if they were used in a way that effectively contributed to the purpose of the lesson. Regarding the use of video in an elementary classroom, a participant stated, "[the teacher] wasn't just using the technology as a way to keep the kids occupied ... [she] actively engaged them throughout the use of [the video]."

Likewise, participants commented on classroom arrangement as either contributing or disturbing the flow of the lesson. Having the students change places during a lesson was good because "its good to get the kids to move around" but on the other hand, "to make the best use of time, I would have had the video set up to where they didn't have to get up and move." Participants also noticed the cramped nature of the classroom as a detriment

while recognizing some of the strategic decisions that the teacher made for the purpose of eye contact.

4.8.4 Analysis by themes: Effect-focused themes

A major thematic category about the effect of a lesson on student interest, engagement, and behavior was also present in participant discussions. This category included a strong presence of comments in which participants seemed to identify with the students in the classroom. Participants often made statements such as, "If I had been a student I would have _____." Themes that emerged within the effect of a lesson on students included affective impact, development of knowledge or skill, and student engagement (table 4.21).

Table 4.21: Effect-focused themes.

Theme	**Frequency**	**# of Observations**
Student Engagement	28	6
Affective Impact	17	5
Student Respect	9	4
Development of Knowledge or Skill	2	2

Student engagement

The largest category within the effect of a lesson on students was that of engagement and on-task behavior. Within this category, students spoke of 'kids being engaged,' listening well, and being attentive. A student stated:

> I thought he was a good teacher because ... the students were all engaged the entire time we saw the video. Nobody was talking out of turn. They could have easily done that because they weren't all in the direct teacher's view.

Students may have focused on this a great deal in their discussions because in a one-shot observation engagement may be one of the most salient elements in practice.

Affective impact

Participant comments that were coded as affective impact focused on how students seemed 'happy' or acted like "they wanted to be there." Nine of 17 comments in this category used the word 'seemed' as preservice participants sought to estimate the degree to which students "were enjoying what they were doing." Regarding an observation, one participant commented:

> I think that one of the most important things in a music classroom maybe something that we haven't seen as much in these videos is that these kids are actually kind of happy to be there and wanting to be there, so it seemed like he had a very positive classroom.

This quote exemplified participants' focus on the perceived happiness of students and students' desire to be present in the classroom.

Student respect

Participants recognized and spoke of positive examples of student respect across four observation experiences. Within this category, participants recognized that students had a choice regarding their behavior and were impressed that students chose to direct their attention and efforts towards the lesson. A participant reflected,"I thought that the class really respected him ... I remember my band, the second the teacher would turn around, they would start talking ... [but the students in this class] didn't do that." In another observation, the students "seemed to agree to do" the activities of the lesson. This idea of students 'agreeing' to work with the teacher was the focus of discussions on student respect.

Development of student knowledge and skills

Surprisingly few comments were made about the development of student knowledge or skills. The only two comments made within this category came from a choral observation and the kindergarten observation. In one observation a participant was impressed with the students' vocal performance, in another a participant was impressed by kindergartners' ability to remember what was taught in the previous lesson. The absence of comments about the

development of student knowledge or skills may be due to the one-visit "snapshot" approach to field experiences in this course. Multiple visits to the same site may develop more ideas and discussions within this category.

4.9 Analysis of music major online discussions

Music majors were required by their instructor to participate in online discussions about their weekly field experiences. For the purposes of this study, participants were given access to separate discussion groups based upon their treatment condition (live experience, computer-mediated, or non-participation in the study). Students were required to complete two 1-paragraph posts per week about their field experiences. Students completed less than 30% of required posts by the conclusion of their participation in field experience. Additionally, the control group wrote more discussion posts (97) than did the experimental group (44). These discussion posts were analyzed for descriptive purposes, however, caution should be used in interpreting the meaning of these results because of poor representation and participation.

The most commonly addressed topics within the category of instruction included the use of strategies, the applicability of concepts to music instruction, and classroom efficiency and setting (table 4.22). The use of strategies was the most frequently cited category among participants (40). Posts were similarly balanced between control (23) and experimental groups (17). Ten discussion threads in the control group and three discussion threads in the experimental group dealt specifically with instruction strategies.

Control group discussion focused predominantly on strategies that they felt were strong or innovative while experimental group discussions often focused on strategies that they felt could be further developed or improved. Control group participants appeared to respond positively with a diverse array of strategies used in a fifth grade general music observation and with the use of solfege and rhythm activities used in a 7th grade chorus lesson. The computer-mediated group engaged in discussions on pre-performance rehearsals, the amount of warm-up necessary, and the practice of giving instructions while conducting.

Table 4.22: Online discussion posts that referenced aspects of instruction.

Category Codes	**Live Experience**	**Computer-Mediated**	**Total**
Strategies	23	17	40
Concepts	8	9	17
Efficiency	7	5	12
Setting	11	0	11
Classroom Management	5	0	5
Repertoire & Resources	5	0	5
Modeling	3	0	3

The use of concepts in ensemble rehearsals arose as a strong topic in both control and experimental online dialogue. A participant in the experimental group stated:

> I just wonder if in the "real world" it's unrealistic to be incorporating conceptual goals in every rehearsal. I'm thinking back to the years I spent in school choruses and I don't recall those teachers regularly integrating musical concepts into the rehearsals. The goal was to improve our performance of specific songs.

While many participants agreed with this view point, a few participants argued that an approach beyond "simply practicing" may be a more advantageous approach to music teaching. Online dialogue that developed during this study may have been stimulated by participation in a secondary methods (concurrently taken by some participants in the study) that emphasized the use of conceptual teaching within a rehearsal environment.

Both treatment groups approached the concept of efficiency as an online discussion topic. The control group centered discussions around perceived efficiency problems in a high school chorus classroom and a discussion about effectively planned transitions in the pretest observation. A student summarized control group comments with a comparison of the two observations:

> In our first [pretest] observation, [the teacher] was on the ball almost the entire time her students were with her. There was only a few seconds of down time . . . On the other hand, [the chorus teacher] had more of a laid back approach where there was more transition time and [time] to be social with her students.

Experimental group participants discussed how effectively and efficiently two band directors moved through aspects of a band rehearsal and quickly targeted performance problems.

Control group online discussion topics also included classroom setting (11 posts), classroom management (5), and repertoire/resources (5). Within the topics of classroom setting and classroom management, participants discussed strategic decisions that teachers made to improve the organization and behavior of the classroom. One topic within classroom setting referred to the use of a rug that established seating boundaries for kindergartners and how this aspect reinforced the teacher's approach to classroom management. Finally topics on repertoire and resources covered the issue of programming enjoyable music for students and the effective use of a Smart Board in a classroom. Absent from discussion in these three topic areas were experimental group posts pertaining to these three topics.

Participant discussions on teacher behavior focused on aspects of demeanor, feedback, communication, knowledge, and relationships. Discussions of feedback, communication, knowledge, and relationships occurred only within control group online discussions. However, aspects of teacher demeanor were examined in both the control and experimental group discussions (table 4.23).

Within the construct of teacher demeanor, the most frequently cited topic across groups was teacher enthusiasm or passivity. Both groups referred to the final elementary observation as an example of the positive effect of a teacher's enthusiasm. Because of the teacher's "ability to captivate, he can get away with not calling on everyone because most likely, they are still listening." Within a 7th grade chorus observation, participants in the experimental group noted a perceived lack of enthusiasm, "I had a hard time deciding if her attitude was effective . . . [other teachers] have come across as happy to be there and wanting to work towards a

Table 4.23: Online discussion posts that referenced aspects of teacher behavior.

Category Codes	Live Experience	Computer-Mediated	Total
Demeanor	12	8	20
Feedback	9	0	9
Communication	4	0	4
Knowledge	4	0	4
Relationship	3	0	3

goal." In a similar manner, students in the control group wondered if the lack of projection of a teacher's voice or a teacher's decision to sit down while conducting promoted an overly passive demeanor.

The control group's feedback-related posts were closely related to the construct of teacher demeanor. The control group responded favorably to feedback that was specific and positive. In discussing a high school band observation, participants noted the teacher's specific and constructive feedback. In one part of the discussion, participants made an inference that the positive effect of the teacher's feedback was enhanced by a teacher's use of questions rather than directives. The teacher had two students "assess whether they were higher or lower, thus causing them to find what was wrong instead of telling them in a way that may have seemed accusing or condemning." Participants reacted adversely to an observation in which they perceived that the ratio of critical to encouraging comments was thrown off balance by too many critical comments.

Online discussions that referenced students or the impact of practices on the students differed in content between control and experimental groups (table 4.24). Control group discussions often examined topics related to a particular student in the classroom or practices that differentiated student instruction. Experimental group discussions examined how strategies should be modified according to a student's developmental level.

Table 4.24: Online discussions that referenced students.

Category Codes	Live Experience	Computer-Mediated	Total
Individual Students	9	0	9
Development	1	8	9
Differentiation	7	0	7
Student Alienation	4	0	4
Engagement	2	0	2

Within discussions of particular students, control group participants discussed the impact of differentiated instruction on a boy in a chorus classroom dominated by girls and the hand position of a french horn player in a middle school band. A student noted that the teacher may have spent too much time differentiating instruction for the boy in a chorus classroom; "Did anyone else feel bad for the one boy in the class? I thought she pointed him out way too often." However, other respondents to this thread replied that the strategies were necessary and had minimal effect of the boy's self-esteem: "I think the way that she adapted the lessons for him could have contributed to giving him more confidence and feeling more included."

Experimental group participants discussed aspects of developmental appropriateness in the design of ensemble warm-ups and a kindergarten teacher's approach to instruction. In a discussion thread titled "subtlety anyone" participants wondered if the kindergarten teacher's enthusiastic presentation could be applied to older grade levels. Participants formed a consensus that the teacher's enthusiasm would most likely be scaled back and refined if he were to effectively teach older students.

Within the constructs of differentiation and student alienation, students discussed individual learning styles and a teacher's offhand remark that assumed that all students had an intact nuclear family. Participant discussions about learning styles examined how effective or ineffective online discussion was to their individual learning styles and their frustration that "we continue to have lecture after lecture" in undifferentiated college classes. With regard to

the nuclear family remark, participants noted that teachers must be careful not to alienate students with offhand remarks that assume a given family structure.

4.10 How can the developed tool be improved to optimize field experiences?

As the conclusion of their final experience using the computer-mediated observation tool, participants engaged in a focus group discussion regarding the usefulness of the tool and recommendations for improvements to the tool. Three focus group discussions (Early Childhood Computer Group A, Early Childhood Computer Group B, and the Music Major Computer Group) were recorded and transcribed for analysis. Discussion themes emerged regarding the control of video, qualities of the video, answer checking, how the tool should be used, and suggestions for improving the usability of the tool.

Participants from all three computer-mediated groups cited control over video playback as a strength of the computer-mediated tool. One participant said:

> I liked being in the computer group because you can pause it, if you need to type something in or go back and look for things rather than just watching the video, I think this [is a] lot easier to find more specific examples.

However, another student indicated a practice that may be problematic for students' field experiences:

> You can just click through it until they get to the end of the song so you can find the feedback, you don't have to listen to 5 minutes of, you know a high school band playing this song that doesn't really affect how the lesson's going you know, its just them practicing.

These quotes exemplify both the power and the potential danger of video control.

Participants in the music major focus group and one student in an early childhood focus group cited problems and suggestions regarding video quality. Participants cited the small

size of the video (512 x 384 pixels) as being problematic for capturing the subtleties of classrooms and teacher delivery. One student noted:

> I guess there are subtleties to any given teacher's presentation like facial expression or gesture or things like that, that from this wide view where we see more of the students, we don't pick up on.

In particular, participants noted that videos of band rooms were much more difficult to observe using the small video than were elementary classrooms. The size of band classrooms forced the video camera to be placed at a farther distance from the teacher than smaller elementary music classrooms.

Other identified problematic qualities of video included the stationary focus of the camera and problems of audio. Participants noted that a stationary video camera failed to capture the full context of the classroom and that it would be desirable for the camera to briefly pan across the classroom so that participants would have an understanding of classroom context. Participants also agreed with the proposed idea of being able to access multiple video viewpoints at the click of a button.

Participants in the music major group engaged in a discussion on the optimum length of a video in a computer-mediated environment. The conversation topic was brought up after one student complained that she had difficulty maintaining her attention span while sitting in front of a computer screen. Participants seemed to identify that computer-mediated observation was a much more detailed type of observation than live observation and demanded a shorter video for analysis. A participant commented:

> I mean it was so much, so much happened in this lesson and there is so much that can be learned from this lesson and it only took a half an hour . . . and that's the thing, if you've got a really great teacher, you're going to be able to see most of what makes them a really great teacher in 30 to 45 minutes and the same thing is true for a not so great teacher.

All participants in the group signified their approval of this final comment when it was suggested that the optimum length may be 30 minutes.

Participants in both the early childhood and music major groups identified the answer checking feature of the computer program as a source of user frustration. A participant identified that it was wrong to judge correctness because an observation is a subjective experience: "Sometimes when it said you were wrong, that was kind of, I didn't like that, because, it is an observation, how can you be wrong? Like, its your opinion." However, the feedback feature of the answer checking system was identified as a potential strength of the program.

While the answer checking function was cited as a source of frustration, the feedback system that allowed students to view responses from a panel of experts after checking their answers was viewed as a helpful feature. One student stated:

> I liked being able to see other people's comments, like after you get it, you press 'more info' to see what the other answer was in comparison to yours. I thought that was kind of neat, because I would look at it sometimes and would be like, "Oh, I didn't even think that that could go in this category."

This opportunity to read other viewpoints was thoroughly used throughout the computer-mediated experience.

Regarding the theme of how the tool should be used, participants identified that they felt farther removed from "real experience" with the tool and that it may be advantageous to pair virtual with live experience. A participant noted that "I feel kind of far removed from the situation watching it on video" and that "being removed" was a negative outcome of virtual experience. Participants in the music major group then engaged in a discussion on how live experience could be paired with the use of the online video tool. Participants cited that the video tool would allow them to revisit specific points of interest that occurred during the observation: "I wouldn't go back and watch the video but I could definitely see

myself going and fast forwarding to the points that I knew I wanted to look at again because that would only take three minutes, I would do that."

Students made suggestions to improve the usability of the computer mediated tool. Suggestions addressed the navigation of questions, entry of times into the time-entry component, the advantage of computer entry, and the fact that students rarely used the bookmark feature in the program. Participants noted that computer-mediated observations demanded quick access to questions while they watched a video. The questions panel model (3 questions per page with the ability to move forward and backward through pages) was not an efficient enough model to allow participants to quickly find questions during video playback.

The time-entry component generated feedback among participants. This component allowed students to enter a playhead time from the video at the press of a button. Participants desired a more flexible entry component that would allow them to enter multiple times for multiple events or choose "event not found." Finally, the preference for typing in answers versus writing them was noted.

Chapter 5

Conclusion

The purpose of this study was to compare the effectiveness of computer-mediated video, projected video, and live observation on the lesson analysis skills gained in early music education field experiences. The study sought to compare the effect of various forms of field-experiences, both in-person and virtual, and the nature of these experiences. Additionally, the study sought to develop a new observation form and online video tool that could assist preservice students in analyzing field experiences. The following research questions provided the framework for this study:

1. What is the effect of computer-mediated video, projected video, or live experience on the development of lesson analysis skills in early music education field experiences?

2. What effects do student background, gender, and technology experience have on computer-mediated, projected video, or live observation?

3. What are the qualitative differences between students' live and virtual observation experiences?

4. How can the developed tool be improved to optimize student field experiences?

This chapter presents an overview of the research design, a comparison to previous studies, major findings, and suggested topics for further study.

5.1 Research design

This study implemented a pretest-posttest control-experimental group design across two parallel studies. In a study of music majors enrolled in an educational foundations course,

the between-groups factor was the use of computer-mediated or live field experiences. In a study of early childhood majors enrolled in a class on integrating music into the elementary classroom the between-groups factor was the use of computer-mediated or projected video field experiences. Subjects in both studies completed a pretest and posttest measure using the Multi-State Observation Form developed for the study. In between pretest and posttest measures, participants attended field experiences using the same observation form but within the context of their respective treatment environments.

In the Music Major Study, data was collected from the pretest-posttest, summative and demographic surveys, and online discussions. All participants in the Music Major Study attended an observation in a *live environment* for the pretest and posttest measures. In between these two measures, subjects participated in their treatment environments and observed the same observations through either a live or computer-mediated experience. To allow the computer-mediated group to observe the same lessons as the live experience group, the computer-mediated group began their treatment one-week after the live experience group. Videos were obtained each week from the live experience, uploaded, and coded for use by the computer-mediated group. Both groups participated in online discussions relevant to their groups through a WebCT tool.

In the Early Childhood Study, data was collected from the pretest-posttest, summative and demographic surveys, and live group discussions. All participants in the Early Childhood Study attended an observation in a *projected video environment* for the pretest and posttest measures. In between these two measures, subjects participated in their treatment environments and observed the same observations through a projected video or computer-mediated experience. Both groups participated in live discussions relevant to their groups during the last 10 minutes of class. These group discussions were recorded and then transcribed for analysis.

Participants from both studies also completed a demographic survey at the beginning of the study and a summative experience survey at the end of the study. Subjects assigned

to computer-mediated groups also participated in a focus-group at the end of the study to identify and discuss strengths, weaknesses, and suggestions for improvement of the computer-mediated tool. Focus group discussions were recorded and transcribed for analysis.

5.2 Previous studies

Though numerous studies have investigated the use of tools to enhance lesson analysis and lesson reflection, few studies have made direct comparisons on the use of these tools in field experiences. The three studies that compared live experience with video-mediated experience found that video-mediated observation may be at worst no different than live observation (Winitzky & Arends, 1991) and at best advantage individuals who use video-mediated observation (Eckrich et al., 1994; Kagan & Tippings, 1992).

Among these studies none have sought as a principal measure to use an observation form that is representative of standards regarding teaching and learning. Winitzky and Arends' (1991) study compared the effects of live and video experience on knowledge and schematic organization of cooperative learning concepts. Eckrich, Widule, Shrader, and Maver (1994) compared the effect of treatment environments on students' knowledge about the mechanics of a baseball swing. While Kagan and Tippings (1992) did compare the broad analysis of lessons, the study did not use a control-experimental design to compare the effect of participation in different environments.

5.3 Findings

This study found no significant differences between groups on the posttest measure in either study (early childhood or music major). However, the Early Childhood Study found a significant difference between control (projected video) and experimental (computer-mediated) groups on a posttest subset of instruction-related items. This significant finding is representative of a divergent trend from pretest to posttest between the control and experimental groups (figure 4.2).

Structuring experiences for early childhood students

Within the Early Childhood Study, the projected video group improved from pretest to posttest while the computer-mediated group regressed. While these growth/decline trends were non-significant, a measure of effect size using Cohen's D demonstrated that the effect was moderately strong (d=0.72). Therefore, given a larger sample size statistically significant differences may be found.

These findings may indicate the importance of shared experience in early childhood major preliminary music education field experiences. The projected video group appeared to greatly value and benefit from the ten-minute discussion sessions at the end of each field experience session. While both the projected video group and the computer-mediated group participated in a group discussion at the end of each treatment session, only the projected video group mentioned this aspect as a significant positive advantage of their treatment conditions.

An analysis of the transcript word counts revealed that the projected video group's discussions were more verbose (24,099 words) than the computer-mediated group's discussions (20,210 words). These accumulated findings may reveal a difference in the shared nature of experience between groups. The computer-mediated group used individual computer screens, individual headphones, and watched the video at different rates of speed. The projected video group viewed video on a shared screen, at a common rate of speed, with sound that was broadcast to all members at the same time. These elements may have created a shared experience that allowed for richer discussion and reflective dialogue among early childhood majors. At an entry-level experience, early childhood majors may need this rich dialogue as they navigate new understandings of the nature of music classrooms. The concept of shared experience demands further investigation to determine the interaction between shared field experiences and student background.

Music major resources

Among music majors, both the control and experimental groups improved significantly from pretest to posttest while there was no significant difference between groups on either

measure. Since there were no significant differences between groups, this study raises important questions about the allocation of resources towards these experiences and the strengths and weaknesses of these field experience mediums. Due to travel time and the time needed to complete observation forms outside of field experience classrooms, the live experience group spent roughly 12 more hours on field experiences than did the computer-mediated group. A turbulent context in which gas prices moved between $2 and $4 per gallon added resource expenditures for the live experience group that were not incurred by the computer-mediated group. If there is no significant difference in overall knowledge gained, the use of virtual field experiences may reduce the demand on resources.

This study found that different field experience conditions made different aspects of field experiences salient and meaningful. The self-reported ranking of knowledge impact revealed a contrast between live experience and all other groups across the two studies (tables 4.8, 4.9). All three groups that used some form of video reported their understanding of teacher delivery as being most highly impacted by field experiences. The live experience group ranked this item fifth. Secondly, instructional strategies and motivational strategies appeared among the top four items of all groups except for the live experience group (instructional strategies was fourth for this group and motivational strategies, 7th).

An analysis of music major online discussions, revealed a difference in what groups approached in their dialogue about field experiences. A strong thread across the live experience discussion were conversations about individual students and classroom setting issues that were not present in the video group discussions. During the first observation, students in the live group engaged in an extensive conversation about a lone boy in a choir of girls and how to best meet his instructional needs. Since this boy was not noticeable in the video, no discussions focused on this boy in any of the other groups. Live experience may allow students to focus in on contextual factors, students, and items that direct their interest more so than a video-based field experience. Conversely, video-based field experiences may allow

preservice students to focus on aspects of strategies and teacher delivery on a more detailed level because of the removal of distracting stimuli from the observation.

Advantages and limitations of computer-mediated and projected video

Computer-mediated groups engaged in a very detailed form of observation that was facilitated by the ability to pause and rewind instructional events. The advantage of video playback control has been frequently cited across research literature on the advantages of video in teacher education (Sherin, 2004). In this study, the most frequently cited advantage of the computer-mediated condition was the ability to control (pause, rewind, fast forward) video playback. This finding was reinforced in focus group discussions about the usability of the tool. One student stated, "the video allows you to pause and rewind, which allows you to compare teachers and teaching strategies, as well as watch the teacher several times while focusing on a different aspect of teaching." Another student noted that this control allowed him to jump past parts that he wasn't interested in to get to the end. While the first quote offers advantages for teacher-educators, the second student's comment raised concerns for teacher educators about students who may by-pass important instructional events in an effort to get the observation done.

Other limitations that were identified by participants in the summative survey and focus group discussions included the absence of contextual information, limitations of the viewable area, audio and video problems, and the inability to see many of the subtle aspects of classroom instruction. The reported advantages of live experience revealed that observed teachers often spent time before lessons talking with field experience students and providing them with the contextual background behind the observation. Video groups did not have exposure to these conversations or a first hand knowledge of school geography.

Computer-mediated and projected video groups cited limitations of the viewable area and audio and video problems as the primary disadvantages/negative factors in their experience with video. Participants mentioned that their inability to clearly see students withheld a critical component of lesson observations. Additionally sound problems inherent in classrooms

were magnified by the limitations of microphones and video sound. In one observation, a soft-spoken teacher and a noisy air conditioner strongly impacted the quality of the experience among video participants.

Finally, focus groups noted that within a small internet-based video, they were often unable to see subtle aspects of teacher delivery. For control purposes in this study, the zoom level of all videos was set to wide-angle. This allowed students to see a broader picture of the classroom but also lessened the degree to which they could pick up subtle aspects of teacher instruction. In elementary classrooms this problem was minimized because the video camera was relatively close to the teacher due to the size of the room. In band classrooms, the large size of the room and the resulting distance between the teacher and video camera reduced the ability of a wide-angle video to pick up on subtle aspects of instruction from a distant teacher.

Video solutions

In focus group discussions, students suggested that video could be paired with live experience, limited to 30 minutes, and accessed from multiple viewpoints to overcome video limitations. Students said that pairing video with live experience would give them advantages of a contextual understanding of classrooms with the opportunity to engage in richly detailed analysis after the event. Students believed that the optimum length for a video observation was 30 minutes because they engaged in a more detailed level of analysis within this medium. Finally, participants suggested that adding the capability to switch video view angles within a computer application would provide more flexibility to overcome the limitations of viewable area.

Perception, processing, and attention

This study also found factors that affected participants' observations and how participants perceived, attended to, and understood their field experiences. Across both studies, the measure of self-reported impact on knowledge was significantly related to posttest scores.

This demonstrated that participants accurately predicted the degree to which they were learning about field experiences and classroom instruction.

Gender was a significant factor in the Music Major Study. Females scored an average of nine points higher on the posttest measure than males. This revealed a stark contrast between the ability levels of gender to receive a high rating from raters on an observation form measure. This unexpected finding bears further study and exploration. A factor that had no impact on posttest scores in this study was students' self-reported confidence with their computer skills.

With regard to observer perception and attention, early childhood participants closely attended to aspects of teacher demeanor, delivery, and strategies while they often failed to focus on students or were unable to segment ensemble instruction. Across early childhood discussions, the most prevalent themes were teacher demeanor (56), delivery (55), and the use of strategies (117). Students responded most favorably to teachers who were positive, engaging, efficient, and used a diverse array of strategies that encouraged assessment, social interaction, and problem solving.

The issue of strategies in ensemble rehearsals arose as a frustration by some early childhood majors in their ability to segment, and therefore make meaning out of the activities of ensemble rehearsals. While some participants saw ensemble warm-ups as a collection of diverse strategies, others saw these collections as a singular events. Exemplifying this frustration, a participant commented, "it seemed to me like they just kept doing the same thing over and over again."

Other research in novice, postulant, and expert perception and processing has found similar differences in an individual's ability to segment significant events. Chase and Simon (1973) found that a key difference between novice and master chess players was their ability to "chunk" configurations of chess pieces into meaningful entities. Carter and Gonzalez (1993) found that a teacher whose knowledge was more functionally related to the task of teaching recalled more "well-remembered events" following a lesson observation. In a similar manner,

individuals who have the ability to segment and chunk classroom events into meaningful entities may be advantaged in making meaning out of field experiences. Segmenting and chunking events appears to be more difficult for early childhood majors in ensemble class periods than elementary music settings where events are more salient and memorable.

Also related to segmentation is the participant's ability to observe students within a classroom. In the seventh grade chorus observation, participants watched a video in which over half of the video play-time was footage of students working in groups. An analysis of group discussions revealed an absence of significant dialogue relevant to students in this observation. Students seemed to "zone-out" when watching students and return to paying attention when the teacher reentered the video. Sherin (2001) identified a similar finding reporting that teachers tend to focus on pedagogical principles and fail to critically observe student learning unless a training program is used. In a similar manner, participants in this study spent more time analyzing and discussing pedagogical principals than qualities of student learning.

This study sought to identify the effect of computer-mediated observation on preservice lesson analysis skills in an early field experience. This study raised further questions about how observation experiences can be most effectively structured for early childhood students, the use of resources when experiences are similar, the advantages and limitations of video treatments, solutions to disadvantages and limitations, and how perception, processing, and the effect of student background on field experience attention. As Guyton and McIntyre (1990) suggested, a continued exploration into the "how" of field experiences will yield a continuing improvement of teacher preparation curricula with a resulting improvement in the quality of future teachers.

5.4 Conclusions and recommendations

The following conclusions and recommendations are suggested by the findings of this study and the research literature.

1. Early childhood majors and music majors require different types of structure to fully engage in music education field experiences. The structure of shared experience and group interaction appears to be more effective than computer-mediated experience for early childhood majors in early music-related field experiences.

2. The finding of no significance between music major field experience methods raises questions about the use of resources (time and money) and an exploration of the advantages and disadvantages of various types of field experiences.

3. An investigation of new solutions for the disadvantages of video is needed to continue to improve video as a field experience tool. Participants brought up ideas of pairing video with live experience, developing a tool that allows for multiple camera angles, and improving audio and video quality. These aspects merit further study.

4. Video makes features such as teacher delivery and teacher strategies more salient while suppressing other contextual aspects of classroom instruction. Video can be used as a tool to allow students to focus in on these aspects while live experience continues to be the optimal medium for capturing the full range of contextual aspects of teacher and student interactions.

5. An individual's ability to segment events impacts that individual's ability to make meaning out of an observation experience. Ensemble rehearsals are more difficult for early childhood majors to segment than elementary music classrooms are because the boundaries between instructional strategies and events are not as salient as in an elementary lesson.

5.5 Suggested topics for further study

Implied in the findings of this study are issues that require further study:

1. What is the effect of live experience paired with video experience on preservice lesson analysis skills?

2. What is the optimal arrangement of live experience and video experience to enhance preservice lesson analysis skills?

3. What are further differences between how music majors and early childhood majors segment classroom events? What role does experience play in the ability to segment classroom events?

4. What other tools can be developed that allow preservice students to dialogue with experienced practitioners about preservice experiences in meaningful ways?

5. What effect does camera angle control (ability to watch from multiple viewpoints) have on the quality of virtual field experiences?

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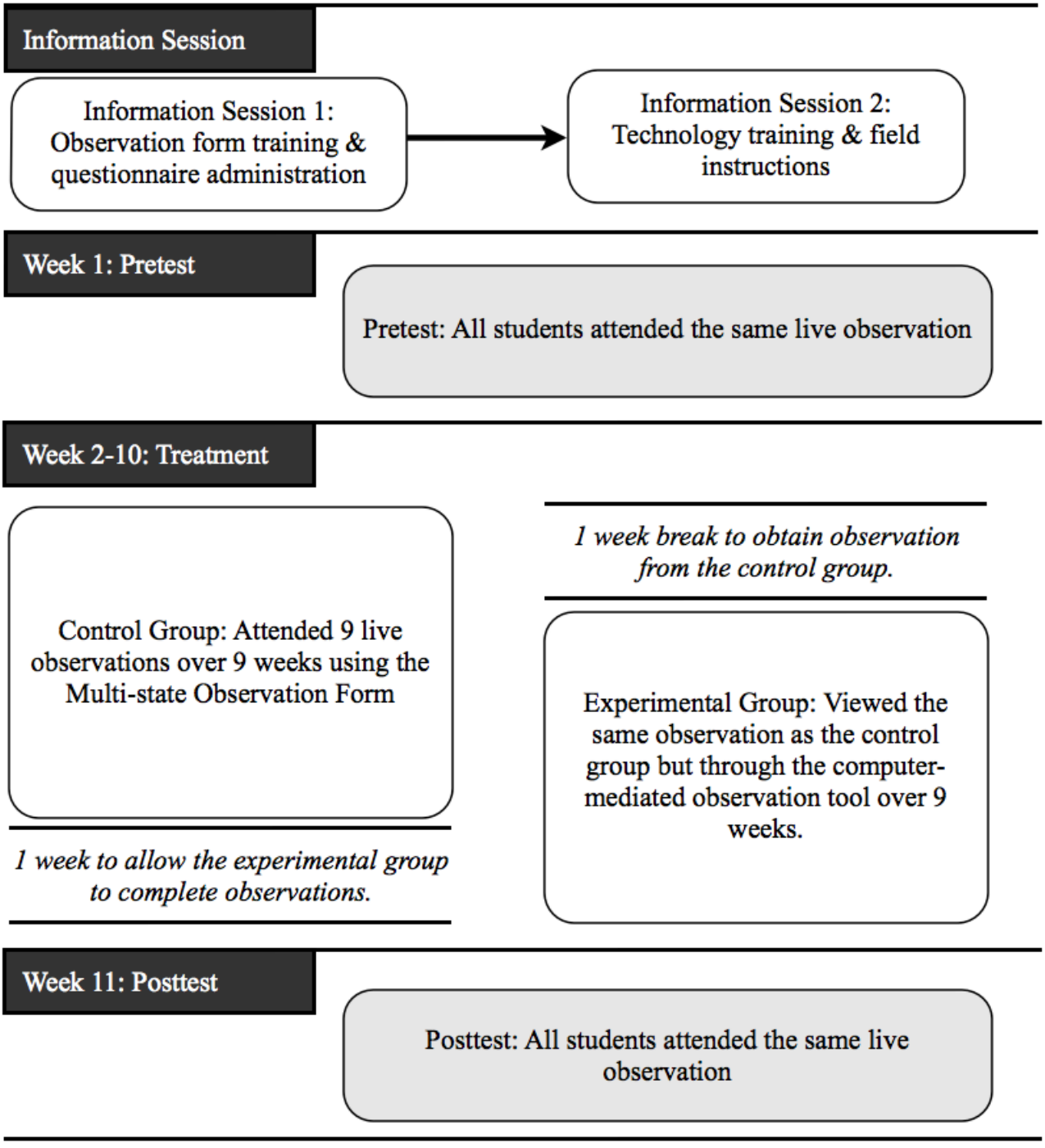
Appendix A

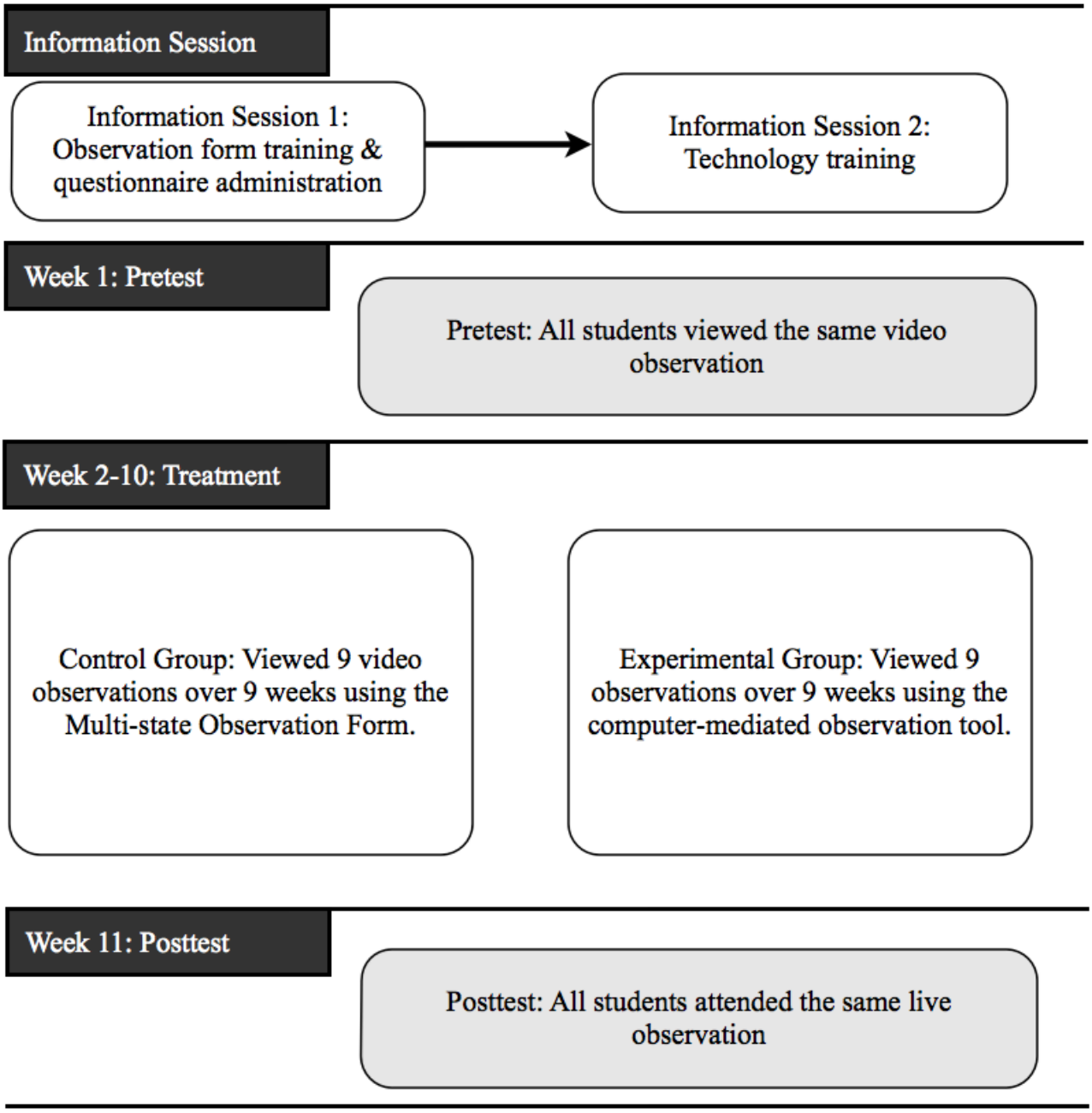
Study Outlines

The following are outlines designed to provide an overview of the two parallel studies of music majors and early childhood majors. The principal differences between these two study designs are the nature of the pretest and posttest, the length of the observations, and the offset or absence of offset between the control and experimental groups. In the Music Major Study, the pretest and posttest occur in a live environment and the control and experimental groups are offset to accommodate the processing, uploading, and analysis of video from the live observations. In the Early Childhood Study, the pretest and posttests occurred in a video environment and there was no need to offset the control and experimental groups.

A.1 Music Major Study

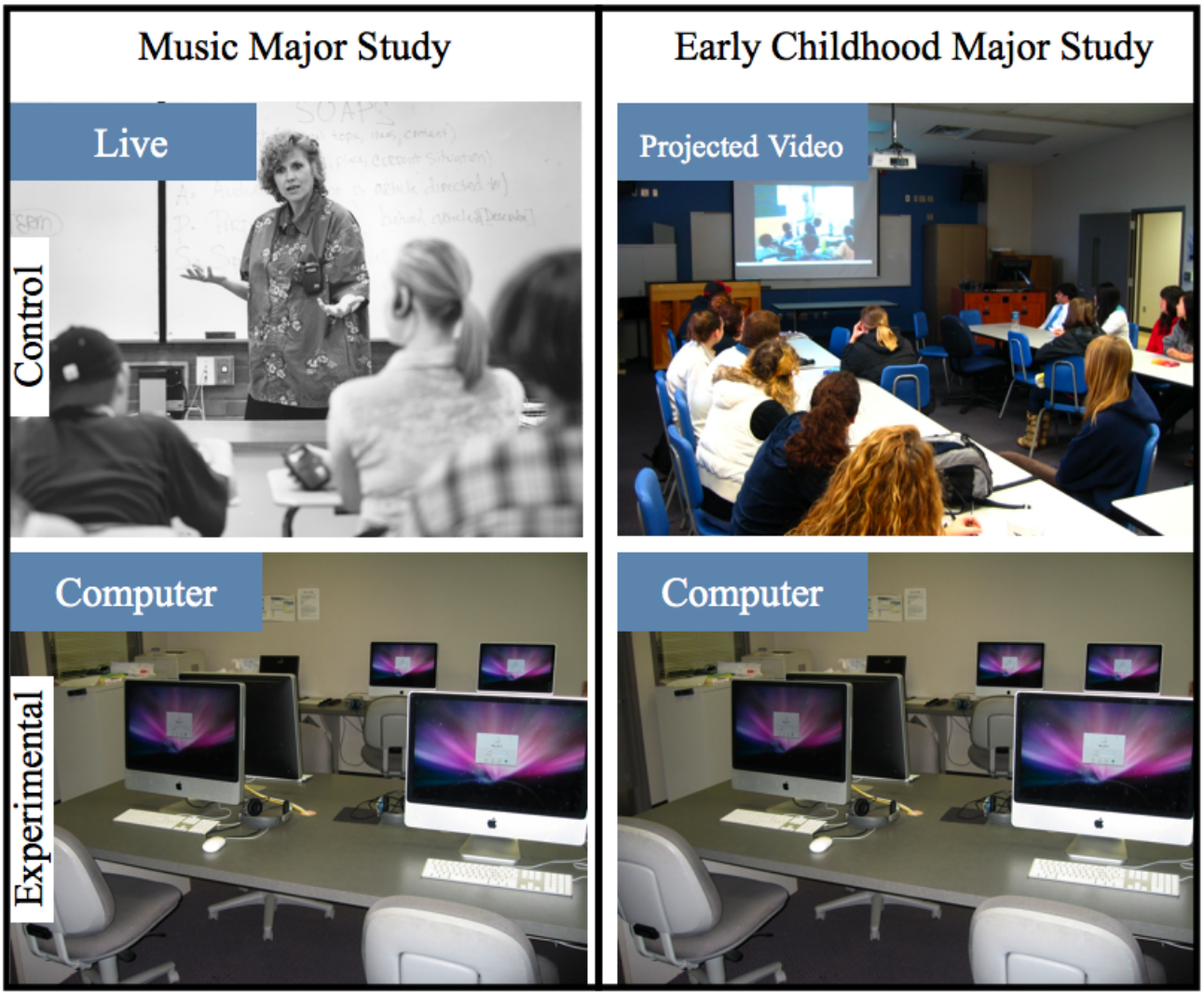


A.2 Early Childhood Study



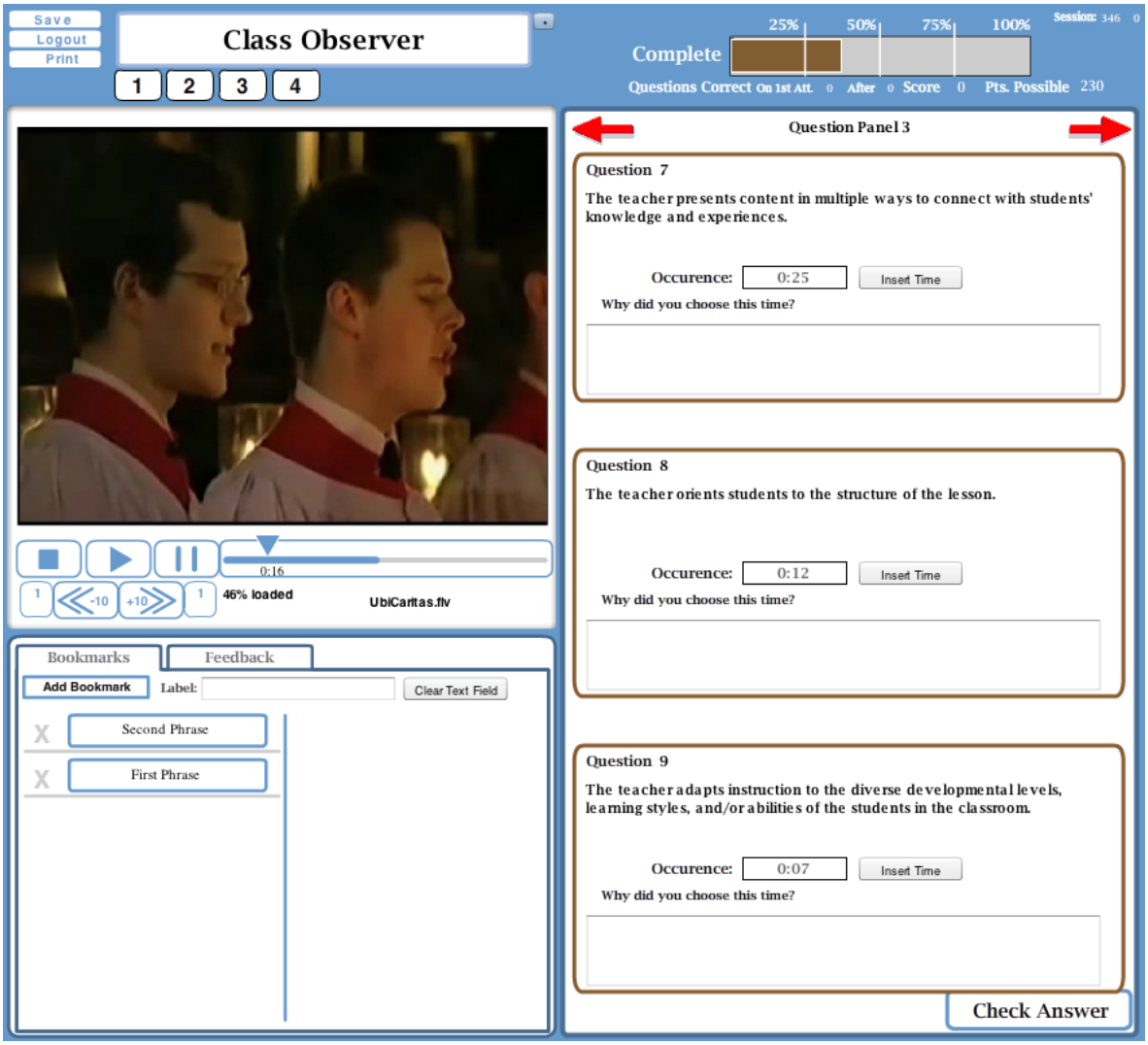
Appendix B

Treatment Environments



Appendix C

ClassObserver Screenshot



Appendix D

Demographic Survey

The following survey was administered as an online survey to all participants:

This survey is designed so that I can collect background information on your name, age, gender, and technology experience. At the conclusion of the study, I will remove your name from all survey information and replace this with a number. Thank you so much for your time.

1. Please enter your name
2. Which class are you in? ___ MUSI 3050 ___ EFND 2110
3. Year in School
4. Major

   ___ Music Education ___ Music Performance

   ___ Early Childhood

   Other (please specify) _____

5. Upon graduating, I anticipate being a (choose the answer that best fits your career plans):

Elementary Teacher	Pre-K Teacher
General Music Teacher	Choir Director
Band Director	Orchestra Director
Private Teacher	Perfomer
Undecided	Other (please specify)

6. Gender ___Male ___Female

7. I am a/an ___ user when it comes to using computers.

Inexperienced	Novice
Somewhat Experienced	Experienced
Advanced	

8. I have used web sites (such as YouTube, Facebook, etc) to watch online video.
   ___ True ___ False

9. I have participated in online discussion groups for classes.
   ___ True ___ False

10. During an average day, I spend ___ hours on a computer.

11. How do you typically use technology? Answer all that apply.

___Word Processing	___Social Networking (Facebook, Twitter, My Space)
___Spreadsheets	___Web Browsing
___PowerPoint	___Music Notation
___Databases	

Other (please specify) _____

12. This is my first field experience/practicum. (A field experience/practicum is defined as a course-related opportunity to visit a classroom as an observer or a teacher)

    ___ True ___ False

    If false please specify the courses in which you have had field experiences or practicums.

Appendix E

Observation Form

An observation form was constructed from an analysis of teacher performance standards provided by all State Departments of Education that had such standards. After an initial analysis it was determined to structure the observation form around four key areas: event identification, instructional planning and delivery, classroom management, and knowledge: content and pedagogy. After an analysis of indicators within these categorical domains, observation form items were developed from the most commonly occurring indicator categories.

Prior to the beginning of the study, students were trained in the use of the observation form through a practice video of a teacher presenting a lesson to a group of college students. Students were encouraged to answer the event section of the observation while in the observation and to use the remaining questions as reflective questions that could be completed after the observation.

Multi-State Observation Form

August 28, 2008

Name: _____ Class Observed: _____

Use this observation form to guide your observations and help you to reflect upon your observation. Complete section I during the lesson. Complete all other sections after the lesson is completed.

Section I: Event Identification

Using the time of occurrence, identify the best example of the following types of events if the event is present in the lesson (ex., 9:30am). Briefly describe the event.

1. The teacher communicates high expectations of student behavior.

Time of occurence: _____
Describe this event:

2. The teacher reinforces desired behavior.

Time of occurence: _____
Describe this event:

3. The teacher uses time-efficient routines and procedures.

Time of occurence: _____
Describe this event:

4. The teacher uses assessment information to modify or adapt instruction.

Time of occurence: _____
Describe this event:

5. The teacher encourages and empowers students to assess their own learning.

Time of occurence: _____
Describe this event:

6. The teacher provides specific, timely, and constructive feedback.

Time of occurence: _____
Describe this event:

7. The teacher presents content in multiple ways to connect with students' knowledge and experiences.

Time of occurence: _____
Describe this event:

8. The teacher orients students to the structure of the lesson.

Time of occurence: _____
Describe this event:

9. The teacher adapts instruction to the diverse developmental levels, learning styles, and/or abilities of the students in the classroom.

Time of occurence: _____
Describe this event:

Section II: Instructional Planning & Delivery

10. The objective of this lesson was made clear.

1 (Low) 2 3 4 5 (High)
Rationale:

11. The teacher used effective instructional resources.

1 (Low) 2 3 4 5 (High)
Rationale:

12. The teacher's verbal and nonverbal delivery of the lesson was effective.

1 (Low) 2 3 4 5 (High)
Rationale:

13. The students were actively engaged in the lesson.

1 (Low) 2 3 4 5 (High)
Rationale:

14. The teacher used a variety of instructional strategies to develop the lesson towards the objective(s).

1 (Low) 2 3 4 5 (High)
Rationale:

15. The teacher linked prior learning to new knowledge.

1 (Low) 2 3 4 5 (High)

Rationale:

16. Describe how the lesson demonstrated or failed to demonstrate the teacher's knowledge of content, student development, and pedagogy.

17. How did the observed lesson develop or fail to develop students' critical thinking, problem solving, and social skills?

Section III: Classroom Management

18. The physical setting of the classroom was safe and engaging.

1 (Low) 2 3 4 5 (High)

Rationale:

19. The classroom environment was safe, purposeful and fair.

1 (Low) 2 3 4 5 (High)

Rationale:

20. Classroom time was efficiently spent on instruction.

1 (Low) 2 3 4 5 (High)
Rationale:

21. Describe how the teacher did or did not use motivational strategies to encourage desired behavior.

Section IV: Knowledge: Content & Pedagogy

22. The teacher clearly communicated a thorough knowledge of central musical concepts and processes.

1 (Low) 2 3 4 5 (High)
Rationale:

23. The teacher integrated knowledge from other subject areas into the lesson.

1 (Low) 2 3 4 5 (High)
Rationale:

Appendix F

Summative Surveys

The following surveys were administered as an online survey to all participants.

F.1 Music Major Study Survey

1. Please enter your name (names will be removed once information is collected and assigned an identifying number)

2. On a scale of 1-5, rate the extent to which you felt that the field experiences in this course assisted you in developing your knowledge about music teaching.
   1 (Low) 2 3 4 5 (High)

3. Based on your experience in this research study, rank order these items according to how significantly this experience has contributed to your knowledge about these areas. (1- Most Significant Impact, 10- Least Significant Impact).
   ___ Use of Resources
   ___ Use of Strategies
   ___ Teacher Delivery
   ___ Student Engagement
   ___ Classroom Settings and Environments
   ___ Motivational Strategies
   ___ Use of Classroom Time
   ___ Assessment and Feedback
   ___ Planning and Setting Objectives ___ Central Musical Concepts and Processes

4. What are the advantages of (live OR computer-video) observation?

   Depending on condition, this question either used the word live or computer-video.

5. What are the disadvantages of (live OR computer-video) observation?

   Depending on condition, this question either used the word live or computer-video.

6. Rate the usefulness of:

   A. Computer-video field experience.

   1 (Low) 2 3 4 5 (High)

   B. Live field experience.

   1 (Low) 2 3 4 5 (High)

   C. Live field experience with the opportunity to also use video.

   1 (Low) 2 3 4 5 (High)

7. What group, if any, do you feel was advantaged in field experience opportunities?

   ___ Computer Group

   ___ Live Observation Group

   ___ Neither, both were equal

8. To what extent were you happy with the experience that you had? Please comment.

   1 Very Disatisfied 2 3 4 5 Very Satisfied

   Comment:

9. Is there anything that I have not asked you that would help me to better understand what you feel to be the strengths or weaknesses of your participation in field experiences this semester?

F.2 Early Childhood Summative Survey

1. Please enter your name (names will be removed once information is collected and assigned an identifying number)

2. On a scale of 1-5, rate the extent to which you felt that the field experiences in this course assisted you in developing your knowledge about music teaching.
   1 (Low) 2 3 4 5 (High)

3. Based on your experience in this research study, rank order these items according to how significantly this experience has contributed to your knowledge about these areas. (1- Most Significant Impact, 10- Least Significant Impact).
   ___ Use of Resources
   ___ Use of Strategies
   ___ Teacher Delivery
   ___ Student Engagement
   ___ Classroom Settings and Environments
   ___ Motivational Strategies
   ___ Use of Classroom Time
   ___ Assessment and Feedback
   ___ Planning and Setting Objectives
   ___ Central Musical Concepts and Processes

4. What are the advantages of (video OR computer) observation?

   Depending on condition, this question either used the word video or computer.

5. What are the disadvantages of (video OR computer observation?

   Depending on condition, this question either used the word video or computer.

6. Rate the usefulness of:

   A. Computer-video field experience.

   1 (Low) 2 3 4 5 (High)

   B. Video Group Experience.

   1 (Low) 2 3 4 5 (High)

   C. Live field experience.

   1 (Low) 2 3 4 5 (High)

   D. Live field experience with the opportunity to also use video.

   1 (Low) 2 3 4 5 (High)

7. What group, if any, do you feel was advantaged in field experience opportunities?

   ___ Computer Group

   ___ Video Group

   ___ Neither, both were equal

8. To what extent were you happy with the experience that you had? Please comment.

   1 Very Disatisfied 2 3 4 5 Very Satisfied

   Comment:

9. Is there anything that I have not asked you that would help me to better understand what you feel to be the strengths or weaknesses of your participation in field experiences this semester?

Appendix G

Discussion Guide for the Early Childhood Study Group Discussions

1. Name a significant event either positive or negative and describe why this event was significant to you.

2. If you were to give one rating to this lesson on a scale of 1-5, how would you rate the lesson and why would you rate it this way?

Directions to facilitators: Allow students the opportunity to freely respond and dialogue to both of these questions. To ensure that all students participate in the discussion ask each student to respond to question number 1. For the rating question, ask all students to provide some indication of how they would rate the class before beginning the discussion. Probe students to give reasoning behind their answers with probes such as "Why did you feel that way?" and "Tell me more about what you mean by . . . "

Appendix H

Grading Rubric for Observation Forms

DUE DATE of forms: Forms are always due on the class period following the observation.

Grading Rubric

Grade	**Definition**
Check-minus	Questions are left unanswered on the observation form or responses are short and incomplete
Check	Questions are answered in a complete manner. A complete manner is defined as completion of the rating scales and at least a sentence in text responses.
Check-plus	All questions are answered and responses are *often* thorough and thoughtful. A thoughtful response moves beyond a pure description of classroom events to a reflection on the event.

Examples of responses within this rubric:

---

17. How did the observed lesson develop or fail to develop students' critical thinking, problem solving, and social skills?

Grade	Example
Check-minus	"They learned about music."
Check	"The students were encouraged to move to the beat. As the students moved they were able to check each other to determine if they were moving correctly."
Check-plus	"There wasn't really much of an opportunity for students to develop critical thinking and problem solving skills. Sometimes the students were asked questions and told to create a steady beat and adjust this beat if it was not steady. But overall, I think that most of the activities of this lesson were teacher-lead and didn't encourage the students to develop their own skills."

20. Classroom time was efficiently spent on instruction.

Grade	Example
Check-minus	"Good. Efficient."
Check	"Every bit of class time was spent on instruction. Great use of time within this lesson."
Check-plus	"This teacher is really efficient in her lessons. I noticed that she quickly started class within the first 5 minutes and had the students working almost from the very first time that they came in the room. The teacher also moved from activity to the next with no break in the instruction."

Appendix I

Description of Observation Sites

Over a 12-week period participants attended or observed 10 different lessons from 9 different teachers. Participants observed a diversity of grade levels ranging from kindergarten to high school. Participants also observed a diversity of rural and urban settings from four different school districts. Types of courses observed included band, chorus, and general music classes. The researcher attempted to include an orchestra observation to the field experience schedule however the only 2 school districts that had orchestra programs within a driveable distance of the university declined to participate in the research study.

1. Students first attended a pretest observation of 5th grade students at a rural elementary school. The school had 547 students with an economically disadvantaged rate of 19% in 2008. The female elementary teacher taught a lesson that focused on the characteristics of Civil War Music within a 45 minute class period. After identifying the essential question of the day, students clapped to the beat of a college marching band song that had Civil War roots. Using a Smartboard, the teacher presented information on the Civil War and instruments of the Civil War. The students studied and performed "The Battle Hymn of the Republic," "Johnny Comes Marching Home," and "Goober Peas." After having the students move to the beat, students performed the beat on rhythm sticks and drums while listening to recordings. The teacher closed the lesson with a review and summary of the essential question.

2. In the second observation, students observed a high school choral class at a rural high school. The school had 1219 students with an economically disadvantaged rate

of 14% in 2008. The female teacher presented a lesson framed around an essential question investigation of text within a 90 minute class period. Students began the class by listening to the Jabberwocky and engaged in a free-journaling exercise on the music. In an extensive warm-up period, students engaged in solfege, vocal exercises, and rhythm activities. After the warm-up, students turned to their copy of the Jabberwocky, discussed the text and rehearsed the song. College students had to leave this observation 20 minutes early due to field experience time restrictions.

3. Students observed an elementary 5th grade general music class at a rural elementary school. The school had 584 students and an economically disadvantaged rate of 17% in 2008. The female teacher presented a lesson on musical form within a 50-minute class period. Students began with a question and answer session around the Liberty Bell March and then watched a brief video of the march provided by the United States Marine Band. The teacher introduced pictures of buildings to demonstrate similarities and differences in how items are structured. Students then proceeded to identify form within Jingle Bells. Then, students engaged in a card activity in which different colored chips were placed on cards to identify the form of the Liberty Bell March. Students then prepared rhythms that they performed on instruments with the recording.

4. Students observed a high school band class at a high school in an urban-cluster area. The school had 1654 students with an economically disadvantaged rate of 40% in 2008. The male teacher presented a lesson around the essential question "How do you write and recognize musical symbols?" in this 90 minute class. Class began with 8 minutes of announcements over the intercom followed by announcements regarding paperwork and performances. Using *Foundation for Superior Performance* warm-up exercises from the Neil A. Kjos Company, students proceeded to play options that reinforced breathing, lip slurs, and chromatic fingerings. Students then transitioned to scale exercises using different scale and arpeggio patterns and chorales. After tuning and beginning to rehearse concert music, the class was interrupted by a school lock-down.

During the lock-down the band continued to rehearse and college students were required to leave this observation 20 minutes early due to field experience time restrictions.

5. Students observed a 7th grade middle school band rehearsal at a rural middle school. The school had 860 students with an economically disadvantaged rate of 17% in 2008. The male teacher was preparing the ensemble for a concert that was a week away during this 45 minute class. The teacher began with breathing exercises, chromatic long-tones, lip slurs, and articulation exercises. Prior to and during articulation exercises, the teacher frequently modeled desired articulations on his trumpet. The group then tuned, performed a chorale, rehearsed a march, and then began work on a slower, more lyrical selection.

6. Students observed a 7th grade choral class at a rural middle school. The school had 860 students with an economically disadvantaged rate of 17% in 2008. On the day that video-taping took place, the female teacher prepared students and assessed students on a weekly rhythm exam during the 45-minute class. Students began with vocal exercises, journaled while listening to Appalachian Spring, and then split up into groups to practice the assigned rhythmic activity. Students were preparing to clap 4-part rhythm exercises for a performance assessment. After a 12-minute period of individual group practice, student groups performed the rhythms in front of the class while the teacher assessed their performances. The class ended with a complete run-through of selections for the upcoming concert.

7. Students observed a high school band class at a rural high school. The school had 1020 students with an economically disadvantaged rate of 31% in 2008. The male teacher focused the lesson on developing students knowledge of and motor skill facility on scales and preparing marching band music during the 55-minute class. The students began the class by practicing scales around the circle of 5ths. When students had difficulty with a scale (in this case the D-flat scale), the teacher would stop the students and have them

verbalize the notes of the scale while fingering or demonstrating slide positions. After 28 minutes of scales, a memorized marching band warm-up, and tuning the students stood up to practice marching band music while marching in place.

8. Students observed a middle school band class at a rural middle school. The school had 591 students with an economically disadvantaged rate of 30% in 2008. The male teacher led the students through scale exercises in thirds, a chorale, and then rehearsed music for an upcoming Halloween concert. The teacher focused most of his comments and instruction on expanding students' dynamic range and articulation within the rehearsal. Due to problems with video taping, only 20-minutes of this class period was captured out of a 45-minute class period.

9. Students observed a rural kindergarten general music lesson at a rural elementary school. The school had 888 students with an economically disadvantaged rate of 55% in 2008. The male teacher introduced the lesson using a "question of the day" that stated the objective in terms of "What is Expression?" Students began the class by improvising movements to the beat of recorded music that mimicked actions that students would do before they went to school. The teacher reviewed the previous lesson on timbre, asked questions about the definition of expression, and modeled different forms of expression on the guitar. The rest of the class was spent creating motions and singing "The bear song" to imitate different expression styles followed by a listening activity with "The Moonlight Sonata."

10. Students observed a posttest observation of the same teacher and the same grade level (5th grade) as the pretest observation. This lesson was the students' first introduction to recorders. Students reviewed the music staff and how to read notes on the music staff. The teacher reviewed B, A, and G on the recorder and the students practiced the song "Hot Cross Buns." After reviewing notes on the staff, students practiced and

performed “Merrily We Roll Along.” The teacher closed with a summary of the day’s lesson and a review of note names on the staff.