

EFFECTS OF INSTRUCTOR-LED FEEDBACK CONFERENCES ON THE LEVEL  
OF REFLECTIVE THOUGHT AMONG SENIOR-LEVEL STUDENTS ENROLLED  
IN A TEACHING METHODS COURSE IN AGRICULTURAL EDUCATION

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Doctorate of Philosophy

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by:

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EFFECTS OF INSTRUCTOR-LED FEEDBACK CONFERENCES ON THE LEVEL OF REFLECTIVE THOUGHT AMONG SENIOR-LEVEL STUDENTS ENROLLED IN A TEACHING METHODS COURSE IN AGRICULTURAL EDUCATION

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## DEDICATION

*I'm glad I did it, partly because it was worth it,  
but mostly because I shall never have to do it again. ~Mark Twain*

To Mom and Dad: Thank you for raising me in a Christian home, supporting me, and never doubting my ability to accomplish any dream. This degree is mostly yours.

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**ABSTRACT**

The purpose of this experimental study was to describe the reflective thinking level of students both overall and by characteristics as well as to compare the effect of reflective feedback conference on students' reflective thought by experimental group. All students ( $n = 28$ ) enrolled in Ag Ed 4330/7330 Teaching Agriculture Subjects participated in the study and were assigned to either a treatment or placebo group. All students had an instructor-led feedback conference with the treatment group receiving a reflective conference and the placebo group receiving feedback without the opportunity to reflect. Both groups then completed an instrument with 3 reflective questions. This experience was repeated three times during the semester.

Most of the students' responses were either technical or descriptive in nature. None of the students in the study were critically reflective. In those areas where a relationship was found, female students and younger students tended to be more reflective. Overall, students who received the treatment showed no difference during the first two rounds but gave a more critical answer during their third and final reflection. Cohen's  $d$  showed this was a small effect size.

## **CHAPTER I INTRODUCTION**

Chapter I describes challenges faced in teacher education programs as well as those faced by new teachers in the classroom. It further describes reflective thought with respect to its potential ability to address these issues, defines the problem, creates a need for the study, and sets forth a theoretical framework from which the problem will be studied. Finally, important terms of the study are defined and the assumptions and limitations of the study are acknowledged.

### **Background and Setting**

The teacher is the single most important variable in the success of a school (Goodlad, 1983). The quality of our schools depends upon the quality of our teachers (Feiman-Nemser, 2001). Teacher preparation programs are designed to do just that - prepare teachers. Many teachers go through a four or five year teacher education program to end up alone in the classroom during the critical first years of their profession. They have been given a variety of teaching tools, but they may or may not have learned how to solve everyday teaching problems (Feiman-Nemser, 2001).

Teaching is a process that requires constant decision making before, during and after class (Berliner & Biddle, 1995; Colton & Sparks-Langer, 1993; Costa, 1995; Lampert & Clark, 1990). In their formal preparation, teachers are taught a specific set of techniques and theories to help them address the myriad of issues and problems they will encounter. Unfortunately, new teachers are generally not interested in theory (Bransford, Derry, Berliner, Hammerness, & Beckett, 2005) and seldom use it to understand

classroom-related problems. Many teacher educators have admitted that the best thing they could do for their students was to teach them to survive (Goodlad, 1990) and solve their own problems. However, no teacher education program can prepare teachers for all possible situations (Han, 1995). Perhaps this reality is why half of all teachers leave the classroom during their first five years (NEA, n. d.).

Teacher education programs can sometimes face an uphill battle. They fight the long-held thought that great teachers are born and not made (Jackson, 1968). Students come to teacher education programs with varying background experiences and an idea of the kind of teacher they would like to be or a model of the type of teacher they would *not* like to imitate (Calderhead, 1988). One fourth of all teacher education students come to preservice education programs believing they can teach without further development of their professional knowledge (Book, Byers, & Freeman, 1983).

Feiman-Nemser (2001) argued that teacher preparation programs were weak influences compared with a teacher's own schooling as a student. These are years of apprenticeship by observation which may not be based on best practices (Borg, 2004; Lortie, 1975). Some scholars claim that these underlying beliefs of preservice teachers must be dealt with during their teacher education program (Borg, 2004; Feiman-Nemser, 2001; Hatton & Smith, 1995; Shulman, 1987). Zeichner and Liston (1987) went as far as to say that "much unlearning has to go on before most students are willing to accept the need for a more reflective approach to teaching" (p. 42). In a preservice program, the opportunity exists to deconstruct some of these long-held misconceptions (DeLay, Washburn, & Ball, 2008).

The process of teaching and learning can further be undermined by the issues related to standardized testing, meeting standards, and outcome-based assessment (Ward & McCotter, 2004). Often, teachers are evaluated based on their students' performance on standardized tests creating in teachers the urge to *cover* material without much thought to student learning or best teaching practices (Blanton, Sindelar, & Correa, 2006). This thinking has trickled up to teacher education programs that have become more competency-based and are more likely to promote a technical-mind set rather than creating free-minded thinkers who are able to reflect (Horton, 1972).

This technical mindset is common in newcomers. Beginners in every area want to know how to perform efficiently using step-by-step instructions (Bransford et al., 2005). A step-by-step process works until the steps need to be altered to accommodate a variation. At that point, the why's and how's of the teaching strategy become important and the need to adapt becomes more critical.

One theory proposed to help teachers solve classroom problems that has emerged over the last century is reflective thought (Rodgers, 2002). Collier (1999) suggested reflectivity in novice teachers became a focus in the 1970s. However, it wasn't until the late 1980's that teacher education programs began making reflection one of the program's educational goals (Bolin, 1988; Bullough, 1989; Korthagen, 1988; Lalik, Niles, & Murphy, 1989; Zeichner & Liston, 1987).

Articles are written assuming that everyone is defining reflection in the same way (Kember, McKay, Sinclair, & Wong, 2008). In order to write about reflection in a scholarly way, a definition must be chosen as the foundation of the study. Reflection, as

it relates to teaching, can be defined as “deliberate thinking about action with a view to its improvement” (Hatton & Smith, 1995, p. 40).

The idea of reflection appears to have developed as a response to the view of teachers as technicians of the curriculum (Calderhead & Gates, 1993). If teacher education programs can teach teachers to reflect, they would be able to solve their own pedagogical problems more effectively (Cruikshank & Metcalfe, 1993; Dewey, 1933; Glen, 1995; Lee, 2005; Schön, 1987). Reflecting on their own learning can help a new teacher critically examine their own assumptions about teaching and learning (Bransford et al., 2005; Parsons & Stephenson, 2005), reflect on their behavior and surroundings, and make valid decisions (Guyton & McIntyre, 1990; Mule, 2006; Murray, 1986; Smyth, 1992; Zeichner & Liston, 1987).

Fullan (1999) made the case that reflection is the only way teachers will begin to question practices and think about their classroom in new ways. Dewey (1933) indicated that reflectivity reduces the impulsivity of a teacher and creates an educator who can act intentionally and deliberately. He stated “the function of reflective thought is to transform a situation in which there is experienced obscurity, doubt, conflict, disturbance of some sort, into a situation that is clear, coherent, settled, [and] harmonious” (Dewey, 1933, p. 100-101).

Reflection does not guarantee success, but rather creates a teacher who learns from setbacks and experiences and continues to reflect (Copeland, Birmingham, De la Cruz, & Lewin, 1993). Reflection in preservice teachers allows them to understand their needs and the problems they are experiencing and allows them to seek resources and ideas to help solve these problems (McIntyre, 1993). This same teacher is able to apply



solutions learned through reflection to similar situations which may occur later. Lacking the ability to reflect means that a teacher is only equipped to react to a challenge (Hillkirk & Dupuis, 1989).

Reflection is important for teachers to practice (Darling-Hammond & Snyder, 2000; Valli, 1992; Zeichner, 1996) as growth is unlikely to occur without reflection (Wildman, Magliaro, Niles, & McLaughlin, 1990). The goal of teacher education programs is to produce an entry level professional. Rudduck (1984) stated that “not to examine one’s own practice is irresponsible; to regard teaching as an experiment and to monitor one’s performance is a responsible professional act (p. 6).” However, reflection is difficult, regardless of how central it is to the teaching process (Richert, 1990). Even though the ability to reflect does not come naturally to all students, it should be encouraged and facilitated in preservice teacher education programs (Han, 1995; Hillkirk & Dupuis, 1989) as reflection is unlikely to develop after a teacher is on the job because of the daily demands of the teacher (Hatton & Smith, 1995). Teaching, as profession, is an uncertain, dynamic, and complex field which requires teachers to make constant judgments about goals, pedagogy, and student learning (Han, 1995) and their ability to reflect may aid in this process.

Reflection and self-direction are important both in the initial phases of learning to teach and later in professional development (Calderhead, 1989; Handal & Lauvas, 1987; Eraut, 1985). The problem with attempting to facilitate reflective thought in a preservice program is that some students are ready to learn in a reflective program while others are not (Korthagen, 1988). Hatton and Smith (1995) warned that problems can result because reflection is often not associated with teaching and that, especially for student teachers, it

is a process seen as esoteric and a distraction from mastering the technical skills required for teaching. Francis (1995) noted that many preservice teachers do not attempt to reflect on their own learning in order to assimilate the information received in class, and have not learned to value their own voice.

### **Statement of the Problem**

Cruickshank (1984) stated that in preservice teacher education programs, an “opportunity should be provided for controlled teaching with subsequent examination of it in order to help teachers to develop good habits of thought and to become students of teaching” (p. 108). These opportunities are called by various names including clinical teaching experiences, mini-teachings, and microteachings, which Allen and Eve (1968) defined as “scaled down teaching encounters” (p. 181). In some preservice teaching methods courses, students teach a lesson to their classroom peers and then receive feedback as well as a performance grade. This verbal and written feedback often comes in the form of a conference whereby the student sits down with an instructor on a one-on-one basis to talk about their teaching performance with the hopes that reflection, as a practice, becomes habitual into their first years of teaching. When teachers reflect, either with a supervisor or their peers, they have deeper thoughts about the art and science of teaching, often making changes to their knowledge and practice (Parsons & Stephenson, 2005).

While arguments have been made that articulating thoughts to others helps to clarify ideas and shape future thoughts (Francis, 1995; Hatton & Smith, 1995; Pugach, 1990), this idea has not always been supported by research (Bain, Ballantyne, Packer, &

Mills, 1999). Brent and Thompson (1996) made the case that one-on-one feedback conferences are time consuming for students and instructors and, therefore, many programs are tempted to allow students to microteach and then rely solely on peer feedback and a self-evaluation of their teaching. Therefore, the problem addressed in this study was to determine if one-on-one feedback conferences are indeed facilitating reflective thinking in preservice teacher education students.

### **Need for the Study**

Feedback conferences have been used with preservice teachers for decades and are intended to create more confident, competent, and reflective teachers. Evidence to suggest that these feedback conferences actually accomplish the desired outcomes is basically non-existent. Further study is definitely needed in this area.

Few studies of critical reflection and even fewer quantitative studies exist in social sciences (Gilstrap & Dupree, 2008). Bates, Ramirez, and Drits (2009) emphasized that while there has been a proliferation of research in this area, little is understood about how reflective thinking is fostered in preservice teachers. This is no doubt a result of the fact that there is not a clear definition of critical reflection and the concept is difficult to operationalize into quantitative questionnaires and research instruments (Hatton & Smith, 1995). Further complicating the challenge, no widely accepted questionnaire exists for measuring reflective thinking (Kember et al., 2000). Ward and McCotter (2004) warned that we are at risk of devaluing reflective skills in teachers simply because it is a process difficult to measure, synthesize, and report.

The literature seems to indicate it is important for preservice teachers to begin developing their reflective ability in order to persist in their future classrooms. Many preservice programs attempt to facilitate reflective thought among their students through the use of one-on-one reflective feedback conferences following a microteaching experience. Feedback conferences require a notably large time investment by both course instructors as well as the students. The question remains, does this one-on-one conference facilitate reflective thinking among preservice teachers?

Potential findings from this study hold implications for teacher education practice including, perhaps most importantly, whether feedback conferences should be held with preservice teachers. Central to this is whether time and energy should be invested in conducting conferences with preservice teachers. Other potential implications could include a modification of the length of conferences or the number of conferences being held. Finally, and most practically, would be modifications to the structure of the feedback conferences in order to maximize the impact.

### **Theoretical Framework**

The theoretical framework guiding the study is a combination of work from Kolb (1984), Costa and Garmston (2002), and Hatton and Smith (1995). Chapter 2 is dedicated to further describing and elaborating on the theoretical framework of the study. In the meantime, a brief overview is offered in this chapter.

Kolb (1984) established the learning cycle describing how individuals have a direct experience upon which they can reflect. From these reflections, they draw rational conclusions and gain insight into whether or not what they did is or is not consistent with

what they know which, in turn, leads to new knowledge. Using this information, a person moves forward acting upon experience and integrating the new knowledge gained, beginning the process again with more refined beliefs (Kolb, 1984). A student in a teaching methods course who is given the opportunity to teach, receive feedback, and self-evaluate three lessons may complete this cycle numerous times, adding to the knowledge process with each lesson taught. Reflection by nature is cyclical in nature because a successful solution often reveals another problem and the process begins again (Copeland et al., 1993).

Instructor-led feedback conferences are designed to provide students with information on their performance and progress. Cognitive Coaching, designed by Costa and Garmston (2002), offers a guide to this process and is designed to enhance a teacher's perceptions, decision-making skills, and intellectual abilities, and in turn, improve student learning. In practice, students are asked questions to guide their thoughts through Costa and Garmston's process. The process includes a preconference where goals and objectives are clarified and teaching strategies are selected. The second phase is teaching where the student delivers their lesson and the coaches observe and gather data for feedback. The third phase, reflecting, involves a post-conference where coaches summarize their impressions, and compare plans with performance. The final phase, applying, allows for the teacher to prescribe application and refinements as well as allows for a reflection on the coaching received (Glanz & Sullivan, 2000).

Students' responses to questions can then be interpreted using four of Hatton and Smith's (1995) five levels of reflection: Technical, Descriptive, Dialogic and Critical. During the technical stage, no reflection occurs and events are simply recalled.

Descriptive reflection attempts to provide reasons for their observations. Dialogic reflection is a self-conversation where possible reasons are explored. The fourth level, Critical, involves putting actions into broader social, political, or historical contexts. The last level was not used in this study because it involves using the other levels of reflection while acting and was not observable from post-activity written reflections.

### **Purpose of the Study**

The purpose of this study was to describe the impact of instructor-led reflective feedback conferences on the level of reflective thought among senior-level students enrolled in a teaching methods course in Agricultural Education.

### **Research Objectives and Hypotheses**

The following research objectives focused and guided the study:

1. Describe the characteristics of the students (age, academic achievement, program emphasis, sex).
2. Describe the reflective thinking level of students.
3. Describe the reflective thinking level of students by their characteristics.
4. Compare the effect of reflective feedback conference on students' reflective thought by experimental group.

H<sub>0A</sub>: There will be no difference in composite reflective scores for Clinical Teaching Experience (CTE) 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1A</sub>: There will be a difference in composite reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0B</sub>: There will be no difference in composite reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1B</sub>: There will be a difference in composite reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0C</sub>: There will be no difference in composite reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1C</sub>: There will be a difference in composite reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

H<sub>0D</sub>: There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1D</sub>: There will be a difference in critical reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0E</sub>: There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1E</sub>: There will be a difference in critical reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0F</sub>: There will be no difference in critical reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1F</sub>: There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

## Definition of Terms

*Clinical Teaching Experience:* A term used to describe the 25 minute mini-lessons taught in Ag Ed 4330/7330 (Teaching Agriculture Subjects). This term is used by the University of Missouri because it is seen as more universal than microteaching or mini-teaching, allowing for inclusion of students in who are not in the teacher certification emphasis (e.g., the leadership emphasis).

*Cognitive Coaching:* Term coined by Costa & Garmston (2002) as “the process during which teachers explore the thinking behind their practices” (Garmston, Linder & Whitaker, 1993, p. 57).

*Competency-based Teacher Education:* Preparing preservice teachers based on defined criteria and standards provided by an accrediting body or agency providing educational oversight.

*Feedback:* “Information communicated to the learner that is intended to modify his or her thinking or behavior to improve learning” (Shute, 2008, p.153).

*Feedback conference:* Post-teaching conference whereby information on the presentation is given to the students by the instructor/teaching assistant.

*Methods course:* A course offered in preservice teacher preparation courses at colleges and universities which teaches the various tools for delivering instruction

*Microteaching:* “A scaled down teaching encounter” (Allen & Eve, 1968, p. 181)

*Preservice teacher:* A student in a college/university teacher preparation program that has not yet graduated and begun a teaching career.



*Program emphasis:* The University of Missouri Agricultural Education department offers two emphases: Teaching and Leadership. Students representing both groups were enrolled in Ag Ed 4330/7330.

*Reflective thinking:* “Deliberate thinking about action with a view to its improvement”  
(Hatton & Smith, 1995, p. 40)

*Yellow (or 3x5) card:* A teaching tool used in the University of Missouri Agricultural Education Department which lists the Rosenshine and Furst (1971) teacher characteristics on one side and a modified version of the Newcomb, McCracken, Warmbrod, and Whittington’s (2004) principles of teaching and learning on the other.

### **Basic Assumptions**

For this study, the following were assumed to be true:

1. The implementers in this study followed the designed protocols for reflective and non-reflective feedback conferences.
2. Subjects provided true and accurate responses on all assessments.
3. The two teacher certification master’s students in the course were similar to the undergraduates.

### **Limitations of the Study**

For this study, the following limitations were identified:

1. The study was limited by a small sample size. Enrollment in the methods course determined the size of the study.

2. While groups were randomly assigned to a treatment, they were not randomly selected.
3. Treatment may not rise to the level of hours required by Wildman and Niles (1987) for a person to be able to practice reflection on his/her own.

## **CHAPTER II REVIEW OF LITERATURE**

Chapter II presents a review of the literature related to reflective thinking, and is divided into four sections. The first section describes teacher education programs. The second defines reflective thought. The third section outlines the theoretical framework of the study and includes a synthesis of studies using Hatton and Smith's (1995) levels of reflection. Lastly, there is an overview of related literature.

### **Purpose of the Study**

The purpose of the study was to describe the impact of instructor-led reflective feedback conferences on the level of reflective thought for senior-level students enrolled in a teaching methods course in agricultural education.

### **Teacher Education**

The teacher impacts student learning more than any other school variable (Darling-Hammond et al., 2006). Teacher preparation in America has traditionally occurred in colleges and universities yet schools of education have long been criticized for their inability to prepare teachers for the job and have been criticized as too removed from current practice (Darling-Hammond et al., 2006). Since 1990, more than 40 states have enacted a process to become a teacher through an alternative certification process (Darling-Hammond et al., 2006), effectively by-passing the four-year teacher education programs at colleges and universities.

While people remain critical of higher education's ability to produce quality teachers, the research continues to show that teachers who complete a traditional teacher education program are better evaluated and more effective with students (Ashton & Crocker, 1986; Evertson, Hawley, & Zlotnik, 1985; Olsen, 1985; Wilson, Floden, & Ferrini-Mundy, 2001). The National Board for Professional Teaching Standards published *What teachers should know and be able to do* (2002) which identified five core propositions: (a) teachers are committed to students and their learning; (b) teachers know the subjects they teach and how to teach those subjects to students; (c) teachers are responsible for managing and monitoring student learning; (d) teachers think systematically about their practice and learn from experience; and (e) teachers are members of learning communities. The fourth proposition seems to be an operationalized definition of reflective thinking.

Professional teacher associations promote the notion of reflection. It is no longer enough for a teacher preparation program to provide teacher candidates who have the appropriate knowledge, skills and dispositions to be a teacher (Ward & McCotter, 2004). According to National Council for Accreditation of Teacher Education's (NCATE) vision, the institution is responsible for encouraging "reflective practice and continuous improvement" while a teacher who graduates from an accredited teacher education program should be able to "reflect on practice and act on feedback" (Professional Standards, 2008, p. 4).

Many have suggested that while preservice curriculums espouse theory about reflective thought, they actually practice a technical approach (Ginsburg & Clift, 1990)

and are based on a set of criteria which must be met. Teacher education programs that are based on reflective practice often have one or more of the following aims:

“To enable teachers to analyze, discuss, evaluate and change their own practice, adopting an analytical approach towards teaching; To foster teachers’ appreciation of the social and political contexts in which they work, helping teachers to recognize that teaching is socially and politically situated and that the teacher’s task involves an appreciation and analysis of that context; To enable teachers to appraise the moral and ethical issues implicit in classroom practices, including the critical examination of their own beliefs about good teaching; To encourage teachers to take greater responsibility for their own professional growth and to acquire some degree of professional autonomy; To facilitate teachers’ development of their own theories of educational practice, understanding and developing a principled basis for their own classroom work; To empower teachers so that they may better influence future directions in education and take a more active role in educational decision-making” (Calderhead & Gates, 1993, p. 2).

### **Methods Course**

Methods classes are taught in an interactive way, providing students with a model of teaching strategies ranging from discussion and demonstration to lecture with the professors modeling the approaches (Goodlad, 1990). A survey of ten nominated agriculture programs showed that a Methods of Teaching Agriculture course is the most common course offered within agriculture teacher preparation programs (McLean & Camp, 2000). Topics that were commonly taught within a methods course included: demonstration, effective teaching, lesson planning, micro-lesson presentations, and principles of teaching / learning, as well as questioning techniques. A content analysis of agricultural education teacher preparation syllabi for methods courses showed 90% used microteaching (Ball & Knobloch, 2005). This same study found 40% of the 43 methods courses analyzed were requiring some type of critique on teaching, whether self, peer or through a feedback conference. Many also provide the opportunity to complete a microteaching experience.

## **Microteaching**

According to McIntyre (1991), 91% of teacher education programs use some variation of microteaching in the curriculum. The exact protocols for this microteaching vary from program to program and have changed vastly from the original definition. The original intent was to practice a specific pedagogical component, such as questioning, in a three to five minute lesson focused on that specific skill (Cruickshank, 1996). In other cases, a mini-lesson is taught to peers or to an actual classroom of students (Brent & Thompson, 1996). Microteaching, begun in the early 1960s (Brent & Thompson, 1996), has been seen for years as a way to connect theory to practice (Cruickshank, 1996) with peers before they apply those skills in a public school classroom (Brent & Thompson, 1996). Microteaching provides an opportunity to gain skills for thinking about, reflecting upon, and analyzing (Brent & Thompson, 1996; Winitzky & Arends, 1991) the teaching experiences.

According to Allen and Eve (1968), there are five conditions which must be met in order to be a microteaching: (a) actual teaching takes place, even though the situation is simulated; (b) the teaching situation is simplified including a reduced number of students, length of class time and scope of presentation; (c) focus is reduced to one specific component, for example, a single teaching methodology; (d) a high degree of control is implemented in the structure, including time and supervision requirements; and (e) feedback is expanded to include self-analysis, peer feedback, a video tape of the teaching exercise, and supervisory input, usually with an opportunity to teach again at a later time and improve based on feedback.

## **Feedback Conferences**

Many times teaching experiences come with self-reflection or peer feedback and occasionally with a feedback conference (Brent & Thompson, 1996). The idea behind one-on-one conferencing with teachers is not new. Usually the conferences are conducted by a supervisor. For a classroom teacher that person might be a principal while, for a student teacher, it might be the university supervisor or the cooperating teacher. At the preservice level, the course instructor, and/or designated teaching assistant serve in this role. Dialogue and the use of questions have been recommended to stimulate students to relate concepts to teaching experiences (Simmons & Schuette, 1988).

Written and/or verbal feedback is critical to making these early teaching experiences as useful as possible (Brent & Thompson, 1996). While there would be benefits to just self-reflection and/or peer feedback, the instructors' expertise is needed to maximize the benefit of the experience (Cruikshank & Metcalf, 1993; Frager, 1985). Simmons and Schuette (1988) caution that a feedback conference intended to promote reflection should not to be used as an assessment of the students.

Videotaping the teaching experience is a practice sometimes used for the students to critique themselves or can be observed with the supervisor during a feedback conference. However, Van Es and Sharin (2002) noted that teachers who observed video did not always notice what was important and could not necessarily link what they were seeing to larger principles and concepts of teaching and learning. However, with clear directions and instruction, students can learn to focus on important behaviors from videotaped teaching.

The way teacher education programs can promote rational and realistic judgment is to give effective diagnostic feedback as it relates to their teaching abilities (McIntyre, 1988). Figure 1 displays the various types of interventions which could occur in the process of providing preservice teachers with feedback (Heron, 1990; Dymoke & Harrison, 2008).

Type of intervention		Purpose	Example of intervention
Directive	Prescriptive intervention (telling)	Directly informs beginning teacher about what to do; gives instructions or suggestions	“when you want the class to measure out the chemicals accurately, stop the class work. Ask them to watch you do a demonstration, focus on the careful use of the dropping pipette and use of the measuring cylinder... that is why I asked you “what are you trying to achieve?” if it is the development of the practical skill of measuring accurately, ask them to count how many drops they use to get 10 ml. of water into the measuring cylinder”
	Informative	Provides information to the beginning teacher	A double lesson is crucial for conducting some practical activities; you wouldn’t be able to get the class to do these otherwise.”
	Confrontive	Challenges beliefs or behavior of the beginning teacher; asks for re-evaluation of some action	“I observed one class throughout that part of the lesson. It was just question and answer and it went on too long. I was expecting something else. What else could you have done on your plan to help bring about deeper learning.”
Non-Directive	Cathartic	Allows the beginning teacher a chance to express thoughts and feelings	“you let me see the lesson plans for that class for the whole week. You had some broad aims for the while set of lessons. Some things did happen differently in the lessons. How do you feel now you have taught these lessons?”
	Catalytic	Helps the beginning teacher become more self aware and reflective	“we have agreed that managing behavior in a practical lesson is very important. Is there anything else you could have tried, in terms of control? What were some of the students doing while the others were taking the measurements? Did you notice, at each workbench, what was happening?”
	Supportive	Tries to boost beginning teachers confidence by focusing on what they did well	I have noticed some crucial things in the lessons this week. You have dealt very well with some students when they give you certain answers. Shall we try together to summarize what was working.

Figure 1. Directive and Non-Directive Interventions



## **Reflective Thinking**

### **Defining Reflective Thought**

To discuss reflection, a common definition must be used. Many terms are used: reflection, reflective practice, reflective thinking, and critical reflection which are all performed by a reflective practitioner.

So what is reflective thought? Definitions vary but most are covered by using Hatton and Smith's (1995) definition: "deliberate thinking about action with a view to its improvement" (p. 40). Knowles' (1993) compiled a great look at the definitions of reflection which have been given by researchers:

While there are varied definitions of reflection (Dewey, 1933; Grimmett & Erickson, 1988; Schön, 1983, 1987; Van Manen, 1977) and as many orientations toward reflective practice – for example, personal, technical, practical and critical (Weiss & Loudon, 1989) – the underlying theme running through these definitions is that reflection is an intra-personal process (Canning, 1990) through which personal and professional knowing can occur (Sikes & Aspinwall, 1990). Reflection is seen as a process and method of information practice with reason (Liston & Zeichner, 1987; Schön, 1988; Witherell & Makler, 1989). Reflection is not seen as being static; implicit in its meaning is action (Schön, 1983; Noffke & Brennan, 1988). It is seen as a vehicle for promoting changed behaviors and practices (Boyd & Fales, 1983) and a means of improving foresight (Buchmann, 1990; Schön, 1983), lessening the chances of taking inappropriate lines of action (p. 83).

At the heart of reflection "is the guiding question 'what is going on here?'" (Noordhoff & Kleinfeld, 1990, p. 174). Calderhead (1992) described a reflective teacher as one who can step back from his/her own practice, evaluate, and take responsibility for future actions. It is the combination of inductive and deductive reasoning (Dewey, 1910). Reflection is concerned with how teachers can make meaning out of incidents which puzzle or perplex them (Grimmett, Erickson, Mackinnon, & Riecken, 1990).

Reflection does involve solving problems, however, teachers “not only perceive and define problems and generate and apply solutions, they also use this process to modify and enhance their understanding of professional practice” (Copeland et al., 1993, p. 349) and as a result their knowledge is reconstructed. Therefore neither the terms learning nor problem solving alone can encompass what occurs during reflection: both terms are necessary.

There seem to be vast differences in the literature as to whether being reflective means thinking about one’s teaching or doing something about one’s teaching (Russell, 1993). Boyd and Fales (1983) defined reflective learning as “the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective” (p. 100). Reflective habits can be both the means of improving teaching as well as an end and valid outcome of teacher education (LaBoskey, 1993; McIntyre, 1993). LaBoskey argued that the primary aim of reflection was a change in beliefs, attitudes, emotions, or values as well as the improved ability to reflect and that the change in teaching practice is secondary.

Zeichner and Liston (1990) identified four types of reflective teaching: (a) an academic version that stresses reflection upon subject matter, (b) a social efficiency version that stresses the thoughtful use of particular teaching strategies, (c) a developmentalist version which stresses a teaching which is sensitive to students and their development, interests and thinking, and (d) a social reconstructionist version which stresses reflection about the social and political nature of schooling and its context within

society. No one version of reflective thinking is sufficient by itself to solve all teaching dilemmas (Zeichner & Tabachnick, 1991).

### **Role of Time in Reflection**

The ability to reflect does not happen during one course or even over a few courses (Ross, 1990). Various theories have emerged as to the time it takes for this thought to occur. Kember et al. (2001) noted that while reflection most commonly occurs during the process of looking back or reviewing past actions, a competent professional can reflect during their practice. However, Kember et al. also note that higher levels or more critical reflection take more time and there is often a gap between observations/experiences to final conclusions (Mezirow, 1991). This gap can range from milliseconds to years (Lynch & Metcalfe, 2006).

Hatton and Smith (1995) made the argument that while reflection may take a long time to develop and may not fully develop during a teacher development program, the demanding world of teacher work may prevent reflection from developing during practice unless the basic techniques are provided during teacher preparation. Changes in teachers' level of reflection appear to occur only over fairly lengthy periods of time (Calderhead & Gates, 1993). One study (Wildman & Niles, 1987) suggested that teachers need 20-30 hours of instruction followed by 20-30 hours of practice in reflection to be able to practice on their own.

## **Topics For and Ways to Facilitate Reflection**

Teachers who reflect on their practice are more desirable than non-reflective teachers who depend upon tradition, authority, and/or circumstance (Cruickshank, 1987; Schön, 1983; Zeichner & Tabachnick, 1991). Reflection occurs in many different settings and takes different forms with different teachers (Wildman et al., 1990).

A problem is necessary to initiate and drive reflection (Hoban, 2000). Experience can only be gained when we have something happen which was unanticipated (Field & Latta, 2001). If there is no problem, there is little motivation to engage in reflection. Reflection does not just happen, but is active and can only occur when particular motivational forces align (Wildman et al., 1990). Reflection may occur as the result of a problem, but may also be encouraged through arranged stimuli (Kember et al., 2001).

Knowles (1993) argued that the best topics for reflection were both immediately relevant and personal. Van Manen (1977) argued that teachers are largely uncritical and non-reflective while planning, adapting materials, developing curriculum, arranging instructional materials, and teaching.

Teachers encounter roadblocks in their attempts to be reflective (Wildman et al., 1990). Failure to find meaning from the reflective process could result from either inability or unwillingness, with inability stemming from lack of cognitive or affective development and willingness relating to a lack of Dewey's (1933) characteristics of openness and wholeheartedness (Copeland et al., 1993). If the teacher does not share a concern presented by a supervisor and assesses the issue only because required, reflection is not likely to occur (Copeland et al., 1993). Unless the practitioner is committed to the problem, solutions from reflection are unlikely (Kirby & Teddlie, 1989).

Both Calderhead (1989) and MacKinnon (1987) argued that novice teachers cannot be expected to reflect on abstract concepts not yet experienced. Preservice teachers who are asked to reflect must have a deep understanding of the subject matter (Harris, Jensz, & Baldwin, 2005) or reflection becomes problematic (Melville, Fazio, Bartley, & Jones, 2008). Han (1995) argued that preservice teachers are not capable of reflection because of their limited classroom experience. There also seems to be some disagreement between scholars of reflective thinking as to whether a student should begin the practice of reflecting by looking at their own actions (Zeichner, 1994) or at the actions of others (McIntyre, 1993).

Reflection is used to recapture an experience in order to evaluate and understand it, but educators must acknowledge the limitations in reconstructing events from memory and from a single perspective (Boud, Keogh, & Walker, 1985). Tom (1985) identified areas that could be the focus of reflection: a) teaching learning process; b) subject matter knowledge; c) political and ethical principles behind teaching, and d) the broad social context of educational institutions. Reflection in teacher education programs appears to be largely focused at the lower two arenas (Valli, 1993).

Teacher education programs have been implementing reflection in many ways. Methods of implementing reflective practice include action research (Carr & Kemmis, 1986; Dinkelman, 1997; Kemmis & McTaggart, 1988; Oberg & McCutcheon, 1989; Pugach, 1990; Ross, 1989; Sparks-Langer & Colton, 1991; Yost, Sentner, & Forlenza-Bailey, 2000; Zeichner, 1986; Zygouris-Coe, Pace, Malecki, & Weade, 2001), autobiographies (Bean & Zulick, 1989; Elbaz, 1988), metaphors (Bullough, 1989; Elbaz, 1983; Francis, 1995; Marshall 1990), reading educational literature (Bell & Gilbert,

1994), peer interviews and instructor-led conferences (Collier, 1999; Koskela, 1985), think aloud protocols and structured curriculum tasks (Ben-Peretz, 1984; Beyer, 1984; Smith, 1991), microteaching (Cruikshank, 1985; Sparks-Langer & Colton, 1991; Zeichner, 1986), surveys (Brookfield, 1995; Hoban & Hastings, 2006), and ethnographies and case studies using theory and research to interpret practice (Calderhead, 1992; Calderhead & Gates, 1993; Gillespie, 1996; Gitlin & Teitelbaum, 1983; Harrington, Quinn-Leering, & Hodson, 1996; LaBoskey & Wilson, 1987; Ross, 1989; Sparkes, 1991; Stoiber, 1990).

By far, the most popular methods have been reflective journals, diaries, and learning logs (Cutler, Cook, & Young, 1989; Francis, 1995; Hoban & Hastings, 2006; Holly, 1984; Korthagen, 1999; Reiman, 1999; Sparks-Langer & Colton, 1991; Surbeck, Park-Han, & Moyer, 1991; Tripp, 1987). These are defined as students writing about their understanding of, reflections on, response to or analysis of an event, experience or concept (Ballantyne & Packer, 1995). However, the theoretical and empirical support for these types of reflection activities is underdeveloped (Bain et al., 1999).

### **Barriers to Reflection**

Reflecting in the classroom is a complex skill which is difficult to acquire (Buchmann & Schwile, 1983; Feiman-Nemser & Buchmann, 1985; Shulman, 1988) hampered by lack of time (Jackson, 1968; Richert, 1990) and the lack of opportunity to reflect (Wedman, Martin, & Mahlios, 1990). Hatton and Smith (1995) argued that reflective thinking is unlikely to develop on the job because of the demanding nature of

teaching. Research indicates that perhaps reflective practice needs a supportive environment in order to occur (Zeichner & Liston, 1987).

### **Evolution of Reflective Thought**

Several theories have guided research in reflective thinking over the last century. Understanding the progression of these theories allows for a better understanding of reflective thinking in the current research context. Dewey's (1910) *How We Think* is largely regarded as the foundation for future theories of reflective thought (Hatton & Smith, 1995; Copeland et al., 1993). Dewey defined reflective thought as "active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it, and the further conclusions to which it tends" (p. 6) or, "judgment suspended during further inquiry" (p. 13). With this definition as a backdrop, reflective thought developed, flourishing in the 1970s (Collier, 1999) and is largely seen as an international reaction to the view of teachers as technicians or passive participants in the education process (Zeichner, 1994).

Significant work in conceptual development was done by Perry (1970). Perry argued that a large amount of cognitive development occurs during the college years and created a growth chart which displays nine positions of cognitive development which range from dualistic to relativism. Perry's work, along with that of Broughton (1975) will later become the ground work for King and Kitchener (1994).

Van Manen (1977) seminal work was titled *Ways of Knowing* and he divided reflective thought into three categories: (1) technical reflection – concerned with the most effective means to an end, (2) practical reflection – concerned with not only the means,

but the goals, outcomes and assumptions, and (3) critical reflection – which includes all of the concerns of practical reflection but also includes moral and ethical concerns of the process. Van Manen was philosophical in his approach arguing that “human beings acquire and understanding of themselves through self-reflection and it is only through life that one can understand life (Grimmett et al., 1990).

Schön had the dominant theory of reflective thinking for most of the 1980s. In *The Reflective Practitioner* (1983), Schön advocates the ideas of Reflection-on-Action and Reflection-in-Action. The first is defined by Francis (1995) as “thinking on your feet” and the second “contemplation undertaken after the practice is completed” (p. 230). Schön encouraged the latter. This theory has been criticized for two reasons:

“underestimating the institutionalized and routinized character of teaching and it overestimates the possibilities of relevant feedback” (Laursen, 1994, p. 128). Yinger (1990) called reflection-in-action by the term improvisation and may occur, for example, as a teacher adjusts a lesson during the class session because they see student difficulties.

Kolb (1984) developed a learning cycle that has been an important theoretical model to illustrate experiential learning. This process indicates that individuals have a direct experience upon which they can reflect. From these reflections, they draw rational conclusions and gain insight into their emotions. Using this information, they move forward acting upon experience and knowledge gained, beginning the process again.

Vince (1998) argued that it was not enough simply to reflect, but to reflect ON reflection in order to call our own process into question and ensure the soundness of the process.

Fendler (2003) argued that the circular patterns of thinking created by reflection can



sometimes serve to reinforce thoughts, even incorrect thoughts, about pedagogical practices and socio-cultural issues.

Since one criticism of reflective thought is that it can be cyclical in nature and serve to reinforce misinformation or misperceptions (Fendler, 2003), input from an outside person (principal, students, and/ or teacher educators or reading educational research) may serve to provide an outside perspective and call into question information that may otherwise be perceived as fact (Bell & Gilbert, 1994; Cochran-Smith & Lytle, 1993; Rhine, 1998; Richardson, 1994). LaBoskey (1993) also suggested that preservice teachers need to interact with those who have observed their teaching and that a broad scope of artifacts and reflective opportunities should be included in the process.

Zeichner and Liston (1987) altered Van Manen's (1977) *Ways of Knowing* for use with student teachers. LaBoskey (1993) revising the work of Van Manen (1977) suggested three categories of focus for reflection: pedagogical/curricular, social/political and moral/ethical, with all being equally important while others suggest that reflection can be categorized into levels.

Griffiths and Tann (1992) identified five types of reflection: (1) rapid reflection which is instinctive and immediate; (2) repair reflection which is habitual, on-the-spot and occurs quite fast; (3) review reflection which takes time to reassess over a few hours to days; (4) research reflection which is systematic and sharply focused and occurs over the course of weeks to months, and; (5) retheorizing and reformulating, a type of reflection that takes months to years and is a deep, abstract, rigorous form of reflection. While Griffiths and Tann agree that all levels are important, they placed a hierarchy on these categories.

King and Kitchener (1994) created a seven-level developmental theory of reflective thinking called the Reflective Judgment Model which moves from pre-reflective to quasi-reflective to reflective thinking. At the earliest stages, learners know because they have directly observed, or been directly told, information. At the higher stages, learners believe knowledge is both learner-constructed and can be uncertain or relative. The final stage involves hold opposing views at the same time.

Brookfield (1995) designed an easy-to-read practitioner's guide called *Becoming a Critically Reflective Teacher*. Teachers are encouraged to ask for student feedback using the Critical Incident Questionnaire and then adjust their instruction accordingly. Brookfield has been credited with coining the term *critical lenses* and identified four perspectives that can be revealed through reflective practice: a) the practitioner; b) the learners; c) colleagues, and d) established theory.

Hatton and Smith (1995) built on the work of previous researchers (Schön 1983, 1987; Shulman, 1987; Smith & Hatton, 1992, 1993; Smith & Lovat, 1991; Van Manen, 1977) and proposed a developmental hierarchy which included five levels: (1) technical-making decisions about the skills of the moment, (2) descriptive – working on having best practices, (3) dialogic – considering all angles of a problem and finding the best solution, (4) critical – seeking ethical alignment of beliefs and practices, and (5) contextualization of multiple viewpoints – using the previous four levels to solve problems as they arise (see Table 1). One level of this hierarchy is no more desirable than another, but rather, a teacher should be able to use many levels (DeLay, Washburn, & Ball, 2008).

Mezirow (1998) is one of the latest to look at reflective thinking and is clear to make a distinction between critical reflection and reflection. Mezirow argued that a person who is simply reflective may rush to judgment and settle on a conclusion without considering all information, and without significant change to personally-held beliefs. Mezirow defined four stages of reflection: habitual action, understanding, reflection, and critical reflection.

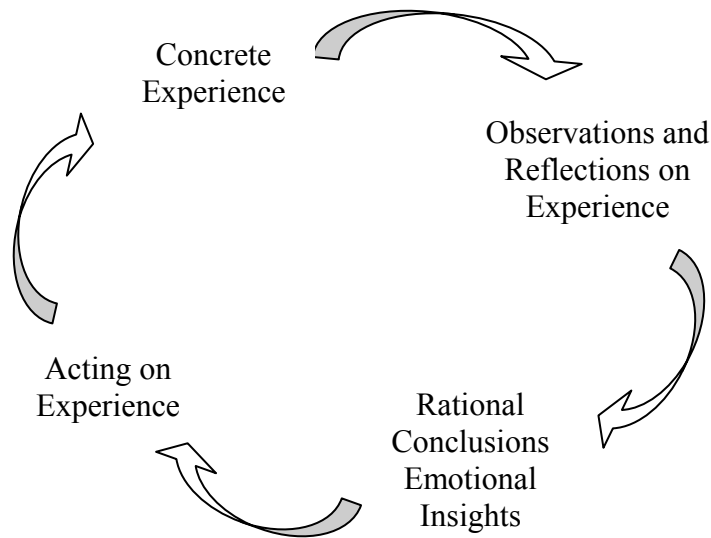
Habitual action is that which has been learnt before and through frequent use becomes an activity which is performed automatically or with little conscious thought. Understanding is understanding without relating to other situations. Reflection is active, persistent and careful consideration of any beliefs or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends. And critical reflection is considered as a higher level of reflective thinking that involves us becoming aware of why we perceive, think, feel, or act as we do” (Leung & Kember, 2003, p. 64).

### **Theoretical Framework**

Since the time of Dewey, reflective thought has been investigated using a myriad of lenses, theories, and frameworks. In order to begin this study, an appropriate framework(s) had to be chosen. In fact, three lenses were used to guide this study.

#### **Kolb’s Learning Cycle**

Kolb established the learning cycle describing how individuals have a direct experience upon which they can reflect (see Figure 2). The process is cyclical in nature making it irrelevant where the process begins. If students have a concrete experience, such as a microteaching experience during a methods course, they make observations and reflect upon that experience, making rational conclusions which they use decide whether to modify any future similar experiences.



*Figure 2. Kolb's (1984) Learning Cycle*

### **Types of Reflective Thought**

Hatton and Smith's model is a hierarchical arrangement of reflective thought levels (see Figure 3). The levels are arranged to indicate a perceived developmental sequence (Kagan 1992). Students can move most easily from listing their actions – technical – to explaining reasons why, or descriptive reflection, and later developing the ability to examine why things occurred, or dialogic reflection (Hatton & Smith, 1995). The last level that can occur in post-situational reflection is critical reflection, considered to be the highest form of reflection (Hatton & Smith, 1995; Knight, 1996; Raelin, 2001; Stein, 2000). The final level involves reflecting, at any level, while in the situation. Level 5 was not used in this study because of the inability to assess a teacher's reflection in action using an instrument after the fact.

Reflection Type	Nature of Reflection	Possible Content
“ <b>Reflection-in-action</b> ” (Schön 1983, 1987)	<b>5. Contextualization of multiple viewpoints</b> Drawing on any of the possibilities 1-4 below applied to situations as they are actually taking place	Dealing with on-the-spot professional problems as they arise (thinking can be recalled and then shared with others later)
“ <b>Reflection-on-action</b> ” (Schön, 1983; Smith & Lovat, 1991; Smith & Hatton, 1992, 1993)	<b>4. Critical</b> (social reconstructionist), seeing as problematic, according to ethical criteria, the goals and practices of one’s profession	Thinking about the effects upon others of one’s actions, taking account of social, political, and or cultural forces (can be shared)
	<b>3. Dialogic</b> (deliberative, cognitive, narrative) weighing competing claims and viewpoints, and then exploring alternative solutions	Hearing one’s own voice (alone or with another) exploring alternative ways to solve problems in a professional situation
	<b>2. Descriptive</b> (social efficiency, developmental, personalistic), seeking what is seen as best possible practice	Analyzing one’s performance in the professional role (probably alone) giving reasons for actions taken
<b>Technical rationality</b> (Schön, 1983; Shulman, 1987; Van Manen, 1977)	<b>1. Technical</b> (decision making about immediate behaviors or skills) drawn from a given research/ theory base but always interpreted in light of personal worries and previous experience.	Beginning to examine (usually with peers) one’s use of essential skills or generic competencies as often applied in controlled, small scale settings.

Figure 3. Framework by Hatton and Smith (1995)

### Cognitive Coaching

Costa and Garmston (2002) are credited with creation of the cognitive coaching approach to facilitate “engagement and transformation of mental processes and perceptions” (p. 3). This relationship can exist between two teachers or between an administrator and a teacher, with the end goals being learning and a stronger relationship between participants. Usually, there is a preconference. The lesson is taught with the coach observing with both coach and teacher reflecting on what is happening. At the post-conference, the coach then helps the teacher through a process of reflection through paraphrasing and asking questions and helps the teacher find ways to apply the lessons

learned to future experiences (Edwards, 1993). Feedback is also sought on the coaching experience to improve it for the next time (Edwards, 1993).

The contrast between cognitive coaching and evaluation is that cognitive coaching uses this reflective process purely to help the teacher be more effective (Garmston et al., 1993). The cognitive coaching process involves six steps. The first step involves the participants summarizing their impressions and assessments of the lesson. Step 2 requires participants to recall data which can support those impressions and assessments. Next, the teacher compares the planned and performed teaching decisions and student learning. Fourth, the teacher should infer relationships between student achievement and the decisions of the teacher. Next, the teacher synthesizes the new learning and prescribes applications for the new knowledge in future situations. Lastly, there should be an opportunity to reflect on the coaching process and make recommendations to help tailor future coaching experiences (Costa & Garmston, 2002).

### **Framework for the Study**

The concept of reflective thought can be investigated using a combination of lenses. Using Kolb's (1984) learning cycle, Hatton and Smith's (1995) framework of reflection, and the cognitive coaching process (Costa & Garmston, 2002), interpretations can be made from students answers to allow understanding of how their reflective thought process is developing.

## **Related Literature**

Reflective thinking is important because teachers in the classroom are going to be expected to solve their own pedagogical issues. They will need to apply theory to real world situations in order to alter instruction and improve student learning. True reflection is not an innate skill, but, rather, must be learned.

Some studies have indicated that preservice teachers valued the opportunity to reflect (Bean & Zulick, 1989; Hillkirk & Dupuis, 1989; Richert, 1990) while others indicated that they do not (Flickinger & Ruddy, 1992; Sebran, 1989). Wedman et al. (1990) studied student teachers in a program designed to make them reflective practitioners through the use of journals, seminars, supervisory conferences and action research, in addition to their own teaching. Findings indicated the possibility was there for students to grow in their reflective ability, if the programs were designed to support that behavior. However, there is a lack of formal authority over curriculum and classroom practices in a student teaching situation, which may impact the practitioner's ability to implement conclusions which are yielded from reflective activity, thus hampering the process of reflecting (Zeichner & Liston, 1987). DeLay et al. (2008) recommended that cooperating teachers receive in-service before the student teaching semester in order to facilitate reflection more effectively with their interns and that they practice a reflective dialogue often during the semester.

In a qualitative study using multiple methods of reflection - bi-daily and bi-weekly journals and reflective interviews – college students were found to stay within the lower levels of Van Manen's levels of reflectivity with the bi-weekly journals and

explored the higher levels of reflection with the bi-daily journals and the reflective interviews (Pultorak, 1993).

In a study at the University of Sydney, Hatton and Smith (1995) reported that “a powerful strategy for fostering reflective thinking is to engage with another person in a way which encourages talking with, questioning, even confronting, the trusted other, in order to examine planning for teaching, implementation and its evaluation” (p. 41). A reflective feedback conference supports these findings because it would allow the students opportunity to think aloud while “being heard in a sympathetic yet constructively critical way” (p. 41). When teachers verbalize their thinking, decisions becomes clearer and they become more aware (Garmston et al., 1993). This supports findings from other studies about the benefits of collaborative rather than individualistic reflection (Dicker, 1990; McNamara, 1990; Smith, 1991; Smyth, 1989).

In an analysis of reflective thinking at the University of Sydney, data (written reports, self-evaluations, microteachings, and interviews) were collected and analyzed from a cohort of students over their four years in a secondary program for a bachelor’s of education. Almost everyone was reflective on some level, with 60-70% being descriptive, but 50% showed multiple perspectives with many beginning at the descriptive level to set the stage for higher levels (Hatton & Smith, 1995). Hatton and Smith contend that technical reflection is a crucial aspect for any novice professional as it provides the foundation for the other forms of reflection. Researchers found that college students reaching what they termed the *critical reflection stage* was not a common occurrence (Hatton & Smith, 1995).



Collier (1999) completed a qualitative look at reflective thought in student teachers at the University of Alabama through a case study approach. Students used reflective journals, while also participating in reflective interviews, peer observation conferences and group seminars. The researcher concluded that student teachers were performing at the lower levels of reflective thought, that reflective thinking is an individual process, and that student teachers struggle with making the jump from learner to teacher.

Kennedy (2005) looked at the development of teaching skills in practicing teachers and found that, even when teachers were unhappy with their teaching performances, less than half of those experiences resulted in new ideas. Lee (2005) found that when student reflections were categorized into three levels – recall, rationalization, and reflectivity - most students were at the rationalization stage. Not all students were able to consistently reach the reflectivity level. Kember et al. (2000) found that postgraduate students are significantly more likely to engage in critical reflection than undergraduates.

In a quantitative study of 321 college students using multiple regression (Gilstrap & Dupree, 2008), academic achievement, gender, and semester were significant predictors of critical reflective ability. The higher scores were achieved by students with higher academic achievement scores, females, and students in their senior year. These findings support earlier case study research on the significance of age and gender in reflective ability with females and older adults reflecting at higher levels (Woods, 1993). There have also been findings that higher levels of reflection occur in the spring semester, as compared to fall, after students are more acclimated to the academic

environment (Tripp, 1993). Tangentially related are findings (Whitmire, 1998) that critical thinking skills are also influenced by gender, age, year in school, and academic achievement. Students with higher grades and upperclassmen were more likely to experience gains in their critical thinking while women and older students were less likely to experience gains.

Bates et al. (2009) studied reflection in graduate students who used journals for reflection with some receiving supervisory interviews. There was no difference found between the group with the intensive involvement of a reflective supervisor and the group which journaled on their own. This was because many students in both groups of the study reported talking to others about their teaching and therefore, no one was reflecting in isolation. Many more recent studies in reflection have looked at facilitating reflection in online discussion and classroom forums (Schlagal, Trathen, & Blanton, 1996; Thomas, Clift & Sugimoto, 1996; Wade, Allison & Stevens, 2000; Whipp, 2003; Yang, 2009).

Within agricultural education, research on reflective thinking has been limited. In a qualitative study of the level of reflective thought demonstrated by preservice teachers in a methods course, many students were shown to reflect mostly on the students as well as planning for change while reflecting in the lower levels of Hatton and Smith's (1995) framework, especially early in the study (DeLay et al., 2008).

A synthesis of the literature was performed in order to better understand the use of Hatton and Smith's framework as it has been used to interpret writings, including language and the kinds of responses which prior studies have used for coding data. The results of this review are displayed in Figure 4.

Level of Reflection	Description	Example	Source
Critical Reflection	Demonstrates awareness that actions and events are not only located in and explicable by multiple perspectives but are located in and influenced by multiple historical and socio-political contexts. Making judgments about whether professional activity is equitable, just, and respectful of persons or not	“What must be recognized, however, is that the issues of student management experienced with this class can only be understood within the wider structural locations of power relationships between teachers and students in schools as social institutions based upon the principle of control.”	Hatton and Smith, 1995
	Social, moral, political, historical, pedagogical, ethical, and/or cultural concerns		Lynch & Metcalfe, 2006; Ward & McCotter, 2004; Whipp, 2003
	“The central question asks which educational goals experiences and activities lead toward forms of life which are mediated by concerns for justice, equity and concrete fulfillment and whether current arrangements serve important human purposes”		Zeichner & Liston, 1987
	Used to question the status quo		Whipp, 2003
	Asks hard questions that challenge personally held assumptions		Ward & McCotter, 2004
	Analysis of power and control and an examination of the taken-for-granted within which the task or problem is situated; making moral evaluations; socially situated; pays attention to ‘Power’		Reynolds, 1998
	Roles, relationships, responsibilities, gender, ethnicity		Pee, Woodman, Fry & Davenport, 2002
Dialogic Reflection	why things occur they way they do; demonstrates a stepping back from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgments and possible alternatives for explaining and hypothesizing.  Integrative of factors and perspectives and may recognize inconsistencies in attempting to provide rationales and critique	“...this was quite possibly due to...” “The problem here was the fact that...” “While it may be true that...” “On the one hand.. on the other” “..in thinking back...on reflection...” “Being in a school like X has made me aware...”	Hatton and Smith, 1995
	Step back from events, weighing various perspectives to analyze the reasons behind situations; Retrospective analysis of situation,	“Are both equally good?”	

	comparing the action with available alternatives and viewing from different frames				
	A form of discourse with oneself, mulling over reasons and exploring alternatives	“I wonder...?, perhaps...?, maybe...?”			Pee et al., 2002
	Dialogic and descriptive are divided into two levels: A is singular in focus and based on one rationale while B is multifaceted and recognizes multiple factors/perspectives				Hatton & Smith, 1995
Descriptive Reflection	Not only a description of events, but some attempt to provide reason justification for events or actions; Based on personal judgments; Recognition of alternate viewpoints in the research or literature	“I chose the problem solving activity because I believe that students should be active rather than passive learners.”	Level A: Singular focus	Level B: Multiple foci	Hatton and Smith, 1995; Lynch & Metcalfe, 2006
	Provides reasons but only in a reportive way	“I did x because y”			Pee et al., 2002
	Analyze reasons for events or actions from their own point of view or that of others	“the second half of the class was spent on a worksheet...students were confused. I don’t like the use of worksheets in math because they do not promote problem solving and communication...”			Whipp, 2003; Hatton & Smith, 1995
Technical (Non-reflective) Writing	Tends to be generalized and definitive; may critique others instead of themselves; self-centered	“Half the class was not there due to suspensions. This struck me as something that would be difficult to deal with, especially as an algebra teacher.”			Ward & McCotter, 2004
	Students interpret them in light of personal worries and previous experience				Whipp, 2003
	Not reflective; no attempt to provide reasons/ justification				Hatton and Smith, 1995
	Merely reporting; description of events that occurred	(I did x; he said y)			Pee et al., 2002; Hatton and Smith, 1995; Whipp, 2003

Figure 4. Synthesis of Literature on Hatton and Smith (1995) for Scoring Responses

## Feedback

Studies have looked at the feedback provided to preservice teacher education students. Feedback is “information provided by an agent (teacher, peer, self, experience, etc.) regarding aspects of one’s performance and understanding” (Hattie & Timperley,

2007, p. 81). Mason and Bruning (1999) defined educational feedback as “any message generated in response to a learner’s action” (p. 1). When considering feedback from the standpoint of performance, the idea is to use the information provided to improve learning and make positive change (Gielen, Dochy, & Dierick, 2003; van der Vleuten & Schuwirth, 2005). However, improvement does not always occur after receiving feedback (Carr, 2006; Kluger & DeNisis, 1996).

In looking at college students in an online course, researchers (Gallien & Oomen-  
Early, 2008) found that students who received personalized feedback were more satisfied and performed better academically than students who only received collective feedback. Teachers who provided students with individualized feedback and encouraged teacher-student interaction were viewed more favorably by their students (Hackman & Walker, 1990). Feedback is critical in the process of knowledge acquisition (Mory, 2004).

Because of its importance, reflective thought has now spread beyond teacher education to other disciplines (Kember et al., 2000). In a qualitative study conducted at the University of Sydney researchers (Poulos & Mahony, 2008) used focus groups with nursing students to understand the students’ perceptions of feedback. They found three key dimensions to feedback effectiveness including perception, impact, and credibility. The participants preferred feedback that was consistent, transparent, and early as well as feedback that consisted of marks along with grades and clear criteria referencing when grading (i.e. rubrics).

According to Brent & Thompson (1996), videotaping allows students to get more complete feedback about their performance. Students valued the videotape of their experience as well as the interaction during the feedback conference as the most valuable

parts of the experience while peer feedback was seen as less valuable (Brent & Thompson, 1996).

Using video to support the reflection of teachers resulted in three major findings. When video was used, teachers were more specific in their reflections, the focus of the reflections shifted from management to instruction, and the teachers focused less on themselves and more on the students after watching a video (Rosaen, Lundeberg, Cooper, Fritzen, & Terpstra, 2008). Other studies (Beck, King, & Marshall, 2002; Sewall, 2009; Sherin & Van Es, 2005; Wang & Hartley, 2003; Westerman & Smith, 1993) looking at video-supported reflection have concluded that teachers with a varying range of experience benefitted from observing videotapes of teaching, regardless of whether it was theirs or another teacher's.

A study which included elementary, middle, and high school teachers identified the purpose of a post-observation conference as providing constructive feedback to the teacher, discussing performance, and providing ideas for the improvement of teaching (Ovando & Harris, 1993). A secondary purpose was to identify strengths as well as areas for improvement. These conferences were seen as the most effective part of the preservice teaching experience (Brent & Thompson, 1996). Ovando and Harris found teachers preferred to hold a conference which began with an acknowledgement of strengths, then proceeded to weakness and ended with an agreement on areas to focus for improvement. Ovando & Harris also found that teachers preferred a positive, nonthreatening environment in which to have their conference.

## Summary

Teaching is a process which requires constant decision making before, during and after class (Berliner & Biddle, 1995; Colton & Sparks-Langer, 1993; Costa, 1995; Lampert & Clark, 1990). One theory proposed to help teachers solve classroom problems that has emerged over the last century is reflective thought (Rodgers, 2002). Reflective thinking has been the goal of many teacher education programs, beginning in the late 1980s (Bolin, 1988; Bullough, 1989; Korthagen, 1988; Lalik et al., 1989; Zeichner & Liston, 1987). If teacher education programs can teach future teachers to reflect, they would be able to solve their own pedagogical problems more effectively (Cruickshank & Metcalf, 1993; Dewey, 1933; Glen, 1995; Lee, 2005; Schön, 1987).

Reflecting on their own learning can help a new teacher critically examine their own assumptions about teaching and learning (Bransford et al., 2005; Parsons & Stephenson, 2005), reflect on their behavior and surroundings, and make valid decisions (Guyton & Mule, 2006; Murray, 1986; McIntyre, 1990; Smyth, 1992; Zeichner & Liston, 1987). Reflective thinking is critical for teachers. Reflection, as it relates to teaching, can be defined as “deliberate thinking about action with a view to its improvement” (Hatton & Smith, 1995, p. 40). Calderhead (1992) described a reflective teacher as one who can step back from his/her own practice, evaluate, and take responsibility for future actions.

There are lots of methods used to facilitate and capture reflective thinking including action research (Sparks-Langer & Colton, 1991; Zeichner, 1986), autobiographies (Bean & Zulick, 1989; Elbaz, 1988), metaphors (Bullough, 1989; Francis, 1995), reading educational literature (Bell & Gilbert, 1994), peer interviews and instructor-led conferences (Collier, 1999; Koskela, 1985), think aloud protocols and

structured curriculum tasks (Smith, 1991), microteaching (Cruikshank, 1985), surveys (Brookfield, 1995; Hoban & Hastings, 2006), using ethnographies, case studies, theory, and research to interpret practice (Calderhead, 1992), and reflective journals, diaries, and learning logs (Korthagen, 1999; Reiman, 1999).

Cruikshank (1984) stated that in preservice teacher education programs, an “opportunity should be provided for controlled teaching with subsequent examination of it in order to help teachers to develop good habits of thought and to become students of teaching” (p. 108). Reflection may occur as the result of a problem, but may also be encouraged through stimuli that are arranged (Kember et al., 2001). These opportunities are called by various names including clinical teaching experiences, mini-teachings, and microteachings, which Allen and Eve (1968) define as “scaled down teaching encounters” (p. 181).

The feedback that follows these experiences is critical to the students. When considering feedback from the standpoint of performance, the idea is to use the information provided to improve learning and make positive change (Gielen et al., 2003; van der Vleuten & Schuwirth, 2005). Feedback conferences are one method used in teacher education. While arguments have been made that articulating thoughts to others helps to clarify ideas and shape future thoughts (Francis, 1995; Hatton & Smith, 1995; Pugach, 1990), this has not always been supported by research (Bain et al., 1999). Brent and Thompson (1996) made the case that one-on-one feedback conferences are time consuming for students and instructors and, therefore, many programs are tempted to allow students to microteach and then rely solely on peer feedback and a self-evaluation of their teaching.



Over the last 100 years, lots of researchers have defined or framed reflective thought. Dewey is credited as the originator of the theory, but his work has been built upon by Perry (1970), followed by Schön in the 1980s, Brookfield (1995) and, most recently, Mezirow (1998). Hatton and Smith (1995) have been chosen as the guide for this study. A synthesis of previous studies using Hatton and Smith's levels of reflective thought was conducted and a table created from that meta-analysis. The work of Hatton and Smith is combined with Kolb's (1984) learning cycle and the principles of cognitive coaching created by Costa and Garmston (2002) to serve as the framework for this study.

Bates et al. (2009) emphasized that while there has been a proliferation of research in this area, little is understood about how reflective thinking is fostered in preservice teachers. This is no doubt a result of the fact that there is not a clear definition of critical reflection and the concept is difficult to operationalize into quantitative questionnaires and research instruments (Hatton & Smith, 1995). Further complicating the challenge, no widely accepted questionnaire exists for measuring reflective thinking (Kember et al., 2000). Ward and McCotter (2004) warned that we are at risk of devaluing reflective skills in teachers simply because it is a process difficult to measure, synthesize, and report. This study attempts to fill a hole in the existing research base.

## **CHAPTER III METHODOLOGY**

Chapter III describes the methodology for conducting the study. Included in this chapter are the research objectives, research design, population, instrumentation, data collection, and data analysis procedures utilized. This study was conducted in accordance with University of Missouri Institutional Review Board (IRB) guidelines. The study was assigned IRB # 1144317.

### **Purpose of the Study**

The purpose of this study was to describe the impact of reflective feedback conferences on the level of reflective thought among senior-level students enrolled in a teaching methods course in Agricultural Education. The following research objectives and hypotheses focused and guided the study.

### **Research Objectives and Hypotheses**

- 1 - Describe the characteristics of the students (age, academic achievement, program emphasis, and sex).
- 2 - Describe the reflective thinking level of students.
- 3 - Describe the reflective thinking level of students by their characteristics.
- 4 - Compare the effect of reflective feedback conference on students' reflective thought by experimental group.

H<sub>0A</sub>: There will be no difference in composite reflective scores for Clinical Teaching Experience (CTE) 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1A</sub>: There will be a difference in composite reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0B</sub>: There will be no difference in composite reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1B</sub>: There will be a difference in composite reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0C</sub>: There will be no difference in composite reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1C</sub>: There will be a difference in composite reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

H<sub>0D</sub>: There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1D</sub>: There will be a difference in critical reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0E</sub>: There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1E</sub>: There will be a difference in critical reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0F</sub>: There will be no difference in critical reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1F</sub>: There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

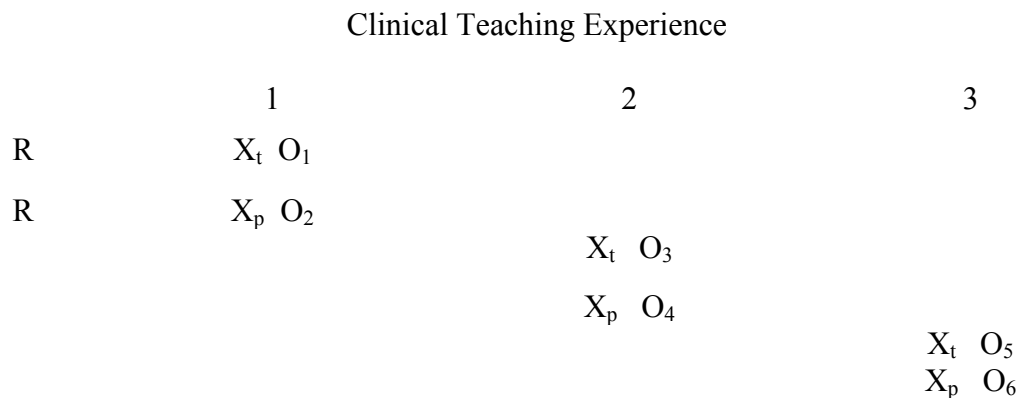
### **Population**

The accessible population was senior-level students in the Agricultural Education program at the University of Missouri. The sample for the study was drawn from the intact group of students enrolled in Ag Ed 4330/7330 (Teaching Agriculture Subjects) during the fall of 2009 ( $n = 28$ ). This group included both preservice teachers ( $n = 24$ ) and non-teaching (leadership) emphasis ( $n = 4$ ) students. The leadership emphasis students complete similar coursework and may work in industry and/or informal education settings. The degree does not involve completing the student teaching process or becoming certified to teach. The teaching emphasis students complete some of their courses through the teacher development program and most will student teach during the semester after completing AgEd4330/7330.

There are several external validity errors that could occur during the research process. Frame error can be defined as an inaccurate listing or representation of the population. Sampling errors occur when the researcher observes only a sample and not the population. Finally, selection error occurs when the subjects in the population do not all have an equal chance of being selected into the study. Since an intact purposive sample was used and the frame was provided based on class enrollment, these errors were not an issue in the study (Ary, Jacobs, & Sorensen, 2010).

## Research Design

This study employed the experimental design referenced as a post-test only comparison group design. Campbell and Stanley (1963) stated that the pre-test is not essential to a true experimental design. The form of the research design can be represented by the following:



Where R = random assignment, X<sub>t</sub>= reflective feedback conference X<sub>p</sub> = placebo feedback conference and O = observations/point of data collection. A horizontal read of this illustration suggest a progression of time across three CTEs.

An experimental design was chosen to investigate the effect of an instructor-led feedback conference on level of reflective thinking, control for extraneous variables, and look for alternative causes. The experimental design was also chosen because of the robust nature of the design when accounting for alternative explanations. Experimental designs allow for the manipulation of the independent variable and the ability to attribute the outcome of an experiment to the treatment. Experiments do not necessarily prove

causation, but do offer a higher level of rigor in controlling alternative explanations (Ary et al., 2010).

The term “comparison” group was chosen over “control” group because the non-treatment group was receiving a placebo feedback conference and the term control group implies that the non-treatment group was receiving no treatment at all. The variables for the experiment are displayed in Table 1.

Table 1  
*Experimental Design of the Study*

Group	Assignment	Treatment	Post-test
A	Random	Reflective Feedback Conference	Reflective Thinking
B	Random	Placebo Feedback Conference	Reflective Thinking

### **Variables of Investigation**

A dependent variable is defined as the outcome (Ary et al., 2010). The dependent variable in this study was the reflective thinking level exhibited by methods students. Reflective thinking was measured by coding student responses to open-ended questions. Reflective thinking was operationalized by Hatton and Smith (1995) into five levels. The first four levels (non-reflective, descriptive, dialogic, and critical) were used in this study.

The independent variable is defined as “the antecedent to a dependent variable” that is “known, or hypothesized, to influence the outcome” (Ary et al., 2010, p. 37). The independent variable in this study was the instructor-led feedback conference. Students were part of an intact methods course and were randomly assigned to either the treatment or placebo group. Students received either a reflective feedback conference or a placebo feedback conference.

## **Control Factors**

With all research, there are threats to internal and external validity. Though these threats are numerous in an experimental design, many can be controlled by the design selection of the experiment (Ary, et al., 2010).

### **Internal Validity**

Internal validity “refers to the inferences about whether the changes observed in a dependent variable are, in fact, caused by the independent variable(s) in a particular research study rather than by some extraneous factors” (Ary et al., 2010, p. 272). Ary et al. defined eleven threats to internal validity: history, maturation, testing effect, instrumentation, regression, selection bias, mortality, selection-maturation interaction, experimenter effect, subject effect, and diffusion. These items are called threats because unless controlled, they can produce an effect that may be mistaken for an experimental effect (Ary et al., 2010).

History refers to items that occur during the course of the treatment that may have an effect on the dependent variable. The longer the treatment period extends, the greater the opportunity for a history threat. These may be political, economic or cultural events or may simply be minor disruptions. The use of a comparison group controls for this threat because both groups would presumably experience the same history threats (Ary et al., 2010).

Maturation refers to the threat of the development, whether physiological or psychological, which experimental subjects may experience due simply to the passage of

time. This threat is also controlled through the use of a comparison group because both groups will presumably develop equally over the treatment period. This means any differences in the groups can likely be attributed to the treatment, if all other threats occur (Ary et al., 2010).

Pre-testing is often used to determine a baseline for a groups' performance. This can promote the testing threat to internal validity. Testing effect refers to the ability of subjects to perform better the second time they see the same version of a test. This threat can be reduced by using equivalent forms rather than using the same test twice. This was controlled by eliminating a pre-test. Random assignment was used to equate the groups (Ary et al., 2010).

Instrumentation is another threat to internal validity. This threat usually occurs when changes are made to the way a variable is measured. These changes might include the measuring instrument, the scorer, the level of difficulty, the administration process, varying observers and more. This is usually controlled by holding instruments as constant as possible. In this instance, the threat was controlled by using one version of the instrument throughout as well as using only one researcher to evaluate all instruments at the completion of the experiment (Ary et al., 2010).

Regression is a threat also known as statistical regression or regression toward the mean. This refers to the tendency of subjects who score very high or very low on the pre-test to score near the mean on a post-test. Regression is also controlled by random assignment of groups to treatment and control groups (Ary et al., 2010).

Selection bias is a threat due to non-equivalent groups. This most likely occurs when in-tact groups are used and the experimenter cannot randomly assign subjects to



treatment and controls. Selection bias was controlled by randomly assigning our in-tact group to the treatment and the comparison (Ary et al., 2010).

Mortality, also known as attrition, is the threat that subjects will drop out of a study at a differential rate between the treatment and comparison groups. This threat is greatest when treatment occurs over a long period of time or when the treatment is highly demanding or rigorous. Mortality is controlled by using an intact group that must complete the requirements as part of a course. There were also attempts to limit both conferences to thirty minutes to keep the treatment and the control equally rigorous (Ary et al., 2010).

Sometimes, threats to internal validity can have an interactive effect with each other. This is the case with the interaction of selection and maturation (Ary et al., 2010). The selection/maturation interact is most likely a threat when using in-tact groups which cannot be randomly assigned. In this study, subjects were randomly assigned and minimized the selection-maturation interaction.

Experimenter effect refers to the threat imposed on a study by a researcher. Personal characteristics may be the influence or the researcher may have an interest in the study that affects their performance in implementing the treatments. Experimenter effects are unintended and can be managed by standardizing all procedures or by having the investigator train other, less invested individuals to perform the treatment (Ary et al., 2010). The experimenter effect was minimized in this study by having multiple (three) trained individuals perform both the treatment and placebo conferences across both lab sections.

Subject effects are all connected to attitude. These effects include the Hawthorne effect where subjects perform differently just because they are aware of an experiment (Ary et al., 2010). Also included is the John Henry effect, also known as compensatory rivalry, whereby the control group decides to provide extra effort in order to be seen equal to the experimental group. Any differences (or lack of differences) may be contributed to this “I’ll show you” attitude (Ary et al., 2010). The last subject effect is compensatory demoralization in which the subjects feel like they are being neglected or receiving a lesser treatment and decide to give up (Ary et al., 2010). The placebo conference was put into place and held for 30 minutes similar to the treatment conference rather than simply omitting treatment with a control group in order to keep both groups engaging in a perceived equal treatment.

Diffusion is the final possible threat to internal validity. Diffusion occurs when word of the experiment or methods leak to the control or placebo group and change responses (Ary et al., 2010). This effect was minimized in the study by deemphasizing the fact that an experiment was being performed.

Ary et al. (2010) identified six procedures that can be used to control for threats to internal validity during an experiment. They are: “(a) random assignment, (b) randomized matching, (c) homogeneous selection, (d) building variables into the design, (e) statistical control ANCOVA, and (f) use of subjects as their own controls” (p. 284). Due to the use of random assignment of subjects to the treatment and the comparison group, many threats to internal validity were controlled in this study.

## **External Validity**

External validity “refers to the extent to which the findings of a study can be generalized to other subjects, settings and treatments” (Ary et al., 2010, p. 292). Threats to external validity exist because of the nature of the experimental design. These were identified by Shadish, Cook and Campbell (2002) as units, treatments, outcomes, and settings. However, Shadish et al. made the argument for inference based upon five principles: Surface similarity, ruling out irrelevancies, making discriminations, interpolation and extrapolation, and causal explanation. This claim will be discussed in further detail later in this chapter.

## **Treatment and Procedures**

### **Treatment**

Students were randomly assigned to either the treatment or placebo group. An additional randomization determined the teaching assistant who would perform the conference. The conferences for the two graduate students were handled by the course instructor. A normalizing session was held among the three conference facilitators prior to each round. Protocols were developed and practiced in order to ensure consistency and inter/intra-rater reliability between and among the conference.

The treatment group received a reflective instructor-led feedback conference using the protocols reported in Appendix B. The placebo group received a non-reflective instructor-led feedback conference which focused on a technical aspect of the course objectives (i.e. lesson planning, interest approaches, and choosing instructional methods), but did not address the student’s teaching ability (see Appendix C). Both conferences

occurred in the days following the CTE and the conferences lasted approximately 30 minutes for participants in each group. Thirty minutes was seen as adequate time for a feedback conference (Brent & Thompson, 1996).

Therefore, this experiment is using techniques that have been established through research on reflective thinking: peer interviews and instructor-led conferences (Collier, 1999; Koskela, 1985), think aloud protocols and structured curriculum tasks (Ben-Peretz, 1984; Beyer, 1984; Smith, 1991), microteaching (Cruikshank, 1985; Sparks-Langer & Colton; Zeichner, 1987) and reflective journals, diaries, and learning logs (Cutler, Cook, & Young, 1989; Francis, 1995; Hoban & Hastings, 2006; Holly, 1984; Korthagen, 1999; Reiman, 1999; Sparks-Langer & Colton, 1991; Surbeck, Park-Han, & Moyer, 1991; Tripp, 1987).

Hatton and Smith (1995) reported that “a powerful strategy for fostering reflective thinking is to engage with another person in a way which encourages talking with, questioning, even confronting, the trusted other, in order to examine planning for teaching, implementation and its evaluation” (p. 41).

## **Procedures**

The University of Missouri’s Agricultural Education 4330/7330 course was an instructional methods course (see Appendix A), typically completed by students during the fall of their senior year before student teaching in the spring. Students enrolled in the course were assigned to three 25 minute CTEs. The term *Clinical Teaching Experience* is used by the course instructors to be more encompassing of non-teaching emphasis students than *microteaching*, but the experiences meet all of Allen and Eve’s (1968)

requirements for a microteaching. The first CTE was a demonstration. The second was an interest approach followed by a presentation of learning content. The third CTE was an application or activity. For each CTE, the planned lessons exceeded the 25 minutes students were allowed to teach. The 25 minute was selected to facilitate an equal teaching experience among all students given the time allocated to the lab sessions. There was a final assignment, performed in team-teaching groups, which was an authentic teaching experience whereby students served as the instructors for a merit badge seminar for area Boy Scouts®. Because this activity was different from the other teaching experiences, it was excluded from the study and thus discussion of methods focused only on the procedures for the first three CTEs.

### **Instrumentation**

One instrument, along with student records, was used to collect the data for the study (see Appendix D). This instrument was developed using a compilation of possible reflective questions. The original questions were compiled from Costa and Garmston (2002), Pultorak (1993), and from a handout on cognitive coaching ([www.education.pitt.edu/mispy/articles/CognitiveCoaching.pdf](http://www.education.pitt.edu/mispy/articles/CognitiveCoaching.pdf)) then narrowed down by a panel of experts (See Appendix B) to three reflective questions using designated criteria (see Appendix G). Several studies have determined that writing can be analyzed to determine level of reflectivity (Kember et al., 1999; Litke, 2002; Wong, Kember, Chung & Yan, 1995).

Students were given a paper copy of the data collection instrument upon completion of their instructor-led conference. The non-graded data collection instrument

was printed on yellow paper with one question on the front side of each page to allow participants ample room to respond. The instructions for responding to the question were included at the top of the first page and indicated that students needed to hand write their answers. This instruction intended to promote consistency and an attempt to get honest, journal-like responses. The instructions also indicated that students should return the form the next time they saw their instructor in class to encourage students to perform their reflections in close proximity to the time of the instructor-led feedback conference.

### **Instrument Validity**

Validity refers to the extent to which the data collection instrument measures what it purports to measure. There are various forms of validity. Face validity is “the extent to which examinees believe the instrument is measuring what it is supposed to measure” (Ary et al., 2010, p. 228). Content validity “concerns the degree to which the various items collectively cover the material that the instrument is supposed to cover” (Huck, 2008, p. 89). Given the purpose and research objectives, face and content validity for this data collection instrument were insured by a review from a panel of experts ( $N = 5$ ) (see Appendix B). As noted earlier, three structured questions were identified with aid from the panel of experts to generate various levels of reflection.

### **Instrument Reliability**

Reliability refers to the consistency of measures produced by a measurement instrument (Ary et al., 2010). Due to the open ended nature of this instrument, no measures of reliability were required for the items in the instrument. However, intrarater

reliability was a concern. To establish reliability, all instruments were coded after data collection was complete. Two months later, all instruments were recoded by the same researcher. Data were then compared by calculating a Pearson Product Moment Correlation. The intrarater reliability for the answers to Question One was .96, for Question Two was .97, and for Question Three was .99.

### **Rubric Development**

Using the synthesized literature on student levels of reflection, a scoring rubric was developed to score students' level of reflection given a structured question (see Appendix F). The rating process for Questions One and Two were the same. The rubric contained seven levels of reflection that were hierarchical in nature. The seven levels were: (a) Technical, (b) Descriptive – singular focus, (c) Descriptive - multifaceted, (d) Dialogic - singular focus, (e) Dialogic – multifaceted, (f) Critically reflective, with an additional category for no response. Figure 4 offers an example of statements that reflect the respective levels of reflection. Students' level of reflection was scored on a scale from 0-7 with 0 being no response and 1 representing a non-reflective technical response. A score of 2 was intentionally left out of the initial scoring process because of later scoring procedures. A response receiving a score of 3 or 4 represented a descriptive reflection, with a score of a 3 reflecting a response showing a singular focus or rationale while a score of 4 was a descriptive response which contained multiple perspectives or factors. This was repeated with the two levels of dialogic reflection using numbers 5 and 6 for singular and multi-focus, respectively. Finally, a score of 7 was used to represent a response rating as critically reflective.

A composite score was calculated by summing the scores received for questions 1 and 2. A sum of 0 meant data were missing for both questions. A sum of 1 or 2 meant the subject was overall non-reflective in his/her responses. The reason the score of 2 was initially left out of the scoring process became apparent as the composite scores were calculated because a score of 2 on Question One and a score of 2 on Question Two would have meant the subject was non-reflective on both questions yet would have yielded a composite score in the reflective range. A composite score between 3 and 12 rated reflective, but not critically reflective. Critical reflection was represented only by achieving a composite score of 13 or 14. Finally, Question Three was scored with a yes/no/no response in terms of their ability to be critically reflective.

### **Scoring Procedures**

To score student responses to three structured questions, the researcher created both a scoring rubric and a response scoring guide from a review of the literature. Both items were used in scoring the responses. For each response to Question One and Question Two, the researcher carefully read it to determine the level of reflection expressed.

Kember et al. (2001) developed a method, whereby the whole paper was examined and the highest level of reflection demonstrated served as the judgment for the paper, consistent with commonly used qualitative procedures (Morton, Dall'Alba, & Beaty, 1993). Said another way, the lower levels are categorized because there is no evidence of higher levels (Ward & McCotter, 2004). This served as the process during the study whereby the entire student response to each question was read and coded based



on the highest level of reflection demonstrated. Each response was rated according to the highest level of reflection achieved for that question. For example, if a subject wrote nine sentences, and three were technical, four were descriptive, one was dialogic and one was critical, the response was scored as a critical reflection. At the conclusion of the scoring process, each student received four data points for reflection. Each student received a reflection score for Question One and Question Two, and a composite score (Question One plus Question Two). Additionally, each student received a critical reflection score for Question Three.

Reliability issues surface in the scoring of the student responses. Inter-rater reliability was defined by Huck (2008) as the “degree of consistency among raters” (p. 81). This type of reliability was not an issue because all coding of student responses was done by one researcher. Intra-rater reliability became a paramount issue. To increase reliability, the researcher waited and scored all forms upon completion of the data collection using a rubric. All (approximately) 84 responses to Question One were scored before moving on to responses for Question Two and likewise for Question Two before Question Three.

### **Data Collection**

Basic descriptive data (age, academic achievement, program emphasis, and sex) were collected from student academic records. Academic achievement was operationalized as cumulative GPA for purposes of this study.

The data collection process was consistent for all participants, except as it pertained to the treatment during the conference. First, students completed their assigned

lesson plans and submitted them one week prior to the presentation. This was graded and returned to the students with enough time to make corrections if necessary. Students taught the lesson with their peers serving as students and the course instructor or teaching assistants evaluating the performance. The lesson was also video recorded and provided to the student for purposes of self-reflection. Upon completion, each student scheduled a follow-up conference with their assigned instructor, within the days immediately following their presentation.

The student brought to this conference a self-critique containing a list of perceived teaching positives and negatives from their lesson based on their reflections from memory or from watching the DVD of their performance. The conference lasted approximately 30 minutes and followed either the protocol for the reflective instructor-led feedback conference (see Appendix B) or the protocols for the instructor-led placebo feedback conference (see Appendix C). The reflective instructor-led feedback protocol was created to spiral the thought process of the participants into higher levels of reflective thought. Interviews, discussions and dialogues must be carefully constructed to force participants beyond generalities and into higher levels of reflection (Whipp, 2003).

The students' grade for each CTE was based upon their original lesson plan, their teaching performance, the self-critique they brought to the conference as well as attending the feedback conference as scheduled. Their grade was not based upon what they said in the feedback conferences or what they wrote on the instrument used for data collection.

All conferences were audio recorded. Upon completion of the conference, students were given the instrument with three reflective questions (see Appendix E) to

which they wrote handwritten responses. Explicit instructions were given. Students were told to be reflective. Each structured question was read or paraphrased as the form was distributed so they the students clearly understood the expectations. In order to allow time for deep reflection and provide time to absorb written peer and instructor feedback, students were told to return the completed form during the next class session. To convey the importance of completing the reflection form, students were told their final grade for CTE 1 would be withheld until their forms were returned. Their answers did not impact their grade but submitting the form was the final step in receiving their grade. This resulted in all forms being submitted within a week of the conference. This was repeated for CTE 2 and 3. Non-response error was not a factor since all students were required to complete the form.

### **Principles of Generalized Causal Inference**

Acknowledging that while random sampling is desirable, it is rarely possible in social science experiments, Shadish et al. (2002) make the argument for inference based upon five principles: Surface similarity, Ruling out irrelevancies, Making discriminations, Interpolation and extrapolation, and Causal explanation. A case cannot be made for inference with only one of the principles, but all five are not necessary either.

The first principle is surface similarity. The idea being that the more similar a situation is to the treatment, setting, population and outcome of the study, the more likely the findings can be generalized. These similarities vary in gradients from being perfectly similar to distinctly different (see Figure 5).

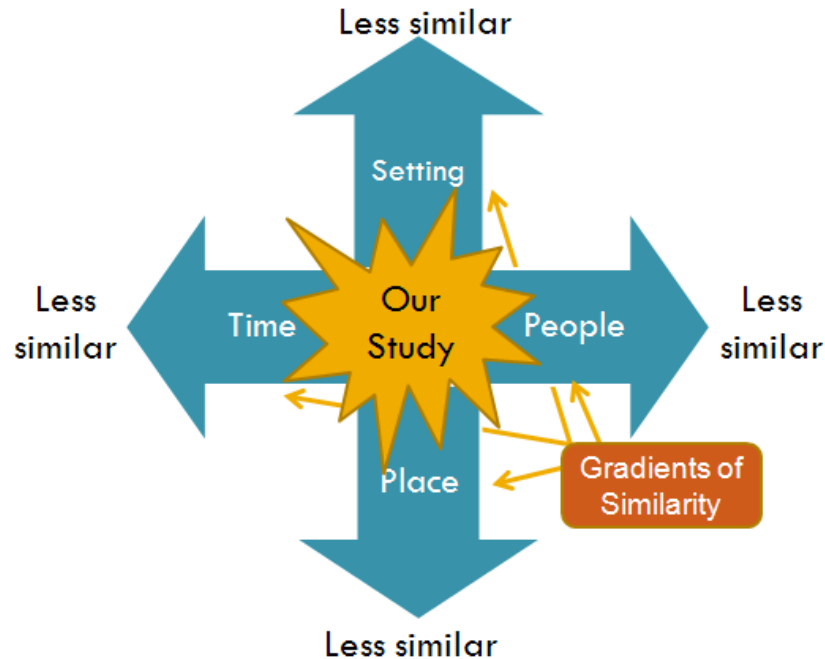


Figure 5. Surface Similarity Diagram (Torres, 2009) based on Shadish et al. (2002)

The second principle is ruling out irrelevancies. This requires consumers of the research to acknowledge that some characteristics of the treatment, setting, and population are irrelevant to the generalizability of the findings.

The third principle has to do with making discriminations. This is an acknowledgement that the results will sometimes apply, and other times will not. The researcher must determine when the results do and do not generalize.

Fourth is the principle of interpolation and extrapolation. The principle of interpolation uses point of data to infer what would have occurred in between while extrapolation uses observed data to infer what would have happened before the first observation or after the last observation in the set. Small interpolations or extrapolations are easier to justify than are large jumps across missing data points.

Lastly is the principle of causal explanation. This is the ‘transfer argument’ that determines the ‘if – then’ of the study. This describes exactly which parts of the treatment affect which part of the outcome and through which causal mediating process in order to accurately replicate the effects of the experiment. Using the principle of surface similarity, the findings of this study can be generalized to groups of methods students whose characteristics and reflective conference procedures mirror those in the study.

### **Data Analysis**

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0 computer program for Windows. Borg and Gall (1989) recommend having at least 15 subjects per experimental group. After randomly assigning all students to an experimental group equally, this experiment only had 14 per group. According to Cohen and Cohen (1983) matters of statistical power influence the alpha level for an experiment. Alpha is the level of risk the researcher is willing to make in committing a Type I error in testing hypotheses (Ary et al., 2010). Increasing the alpha level from a .05 to a .10 decreases the probability of making a type II error and may increase the probability of rejecting a null hypothesis, and thus, increases power (Cohen, 1988). However, even after taking this step, power could remain at an unacceptably low level and must be calculated to aid in the interpretations of any findings from the study. Beta is set at 4 times the alpha, which for this study would be .40. Power is calculated by subtracting beta from 1 ( $1 - .40$ ). That means an acceptable power for this study was .60 (Sexton, Raven, & Newman, 2002). However, with only 14 students in each group and a medium effect size the power was calculated to be .36 (Cohen, 1977). While this is not ideal it is higher than

the .25 power which the study would have had with a .05 alpha. Therefore, the less stringent alpha level was established *a priori* at .10. The magnitude of a relationship was interpreted using Davis' (1971) conventions (see Table 2). Interpretation of effect size was done using Thalheimer and Cook's (2003) descriptors for describing the relative size of Cohen's *d* (see Table 3). Data analysis methods were selected as a result of determining the scales of measurement for the variables.

Table 2

*Davis' (1971) Descriptors for Relationship Magnitude*

Coefficient	Description of Relationship
1.00	Perfect
.70 - .99	Very High
.50 - .69	Substantial
.30 - .49	Moderate
.10 - .29	Low
.01 - .09	Negligible

Table 3

*Thalheimer and Cook's (2003) Descriptors for Describing the Relative Size of Cohen's d*

Value of Cohen's <i>d</i>	Coefficient
$\geq -0.15$ and $< 0.15$	Negligible effect
$\geq 0.15$ and $< 0.40$	Small effect
$\geq 0.40$ and $< 0.75$	Medium effect
$\geq 0.75$ and $< 1.10$	Large effect
$\geq 1.10$ and $< 1.45$	Very Large effect
$> 1.45$	Huge effect

*Objective One: Characteristics of Respondents*

Describe the characteristics of the students (age, academic achievement, program emphasis, and sex).

To complete research objective one, descriptive statistics were reported to analyze the characteristics of the students in Ag Ed 4330/7330 (Teaching Agriculture Subjects). Specifically, frequency counts and percentages were used for nominal and ordinal data. Characteristics analyzed included sex, and program emphasis. Means, standard deviations, and ranges were used to describe continuous data. This characteristic included age and academic achievement as operationalized by cumulative GPA.

*Objective Two: Reflective Thinking*

Describe the reflective thinking level of students.

To complete research objective two, frequency counts, and percentages were calculated as the data were ordinal in nature. This was done by Question, by CTE, and overall. Composite reflection was also reported using means and standard deviations.

*Objective Three: Reflective Thinking Level by Characteristic*

Describe the reflective thinking level of students by characteristic.

The crosstabs feature of SPSS was used as well as Kendall's Tau-b for 2x2 matrices of data and Kendall's Tau-c for 2x3 data.

*Objective Four: Reflective Thinking Level by Conference*

Compare the effect of reflective feedback conference on students' reflective thought by experimental group (placebo and treatment).

Reflective thought was measured by composite reflection scores and a critical reflection score. These two items were analyzed for each CTE. Therefore, the third research objective contained six research hypotheses. An independent samples *t*-test was used to test each hypothesis. Levene's test was used to check the assumption of equal variances. Cohen's *d* was used to interpret effect size.

*Research hypothesis A:*

H<sub>0A</sub> There will be no difference in composite reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1A</sub>: There will be a difference in composite reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:  $H_{0A}: \mu_{RFC} = \mu_P$

The alternative hypothesis was:  $H_{1A}: \mu_{RFC} \neq \mu_P$

*Research hypothesis B:*

H<sub>0B</sub>: There will be no difference in composite reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1B</sub>: There will be a difference in composite reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:  $H_{0B}: \mu_{RFC} = \mu_P$

The alternative hypothesis was:  $H_{1B}: \mu_{RFC} \neq \mu_P$



*Research hypothesis C:*

H<sub>0C</sub>: There will be no difference in composite reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1C</sub>: There will be a difference in composite reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:  $H_{0C}: \mu_{RFC} = \mu_P$

The alternative hypothesis was:  $H_{1C}: \mu_{RFC} \neq \mu_P$

*Research hypothesis D:*

H<sub>0D</sub>: There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1D</sub>: There will be a difference in critical reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:  $H_{0D}: \mu_{RFC} = \mu_P$

The alternative hypothesis was:  $H_{1D}: \mu_{RFC} \neq \mu_P$

*Research hypothesis E:*

H<sub>0E</sub>: There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1E</sub>: There will be a difference in critical reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:  $H_{0E}: \mu_{RFC} = \mu_P$

The alternative hypothesis was:  $H_{1E}: \mu_{RFC} \neq \mu_P$

*Research hypothesis F:*

H<sub>0F</sub>: There will be no difference in critical reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1F</sub>: There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

The null hypothesis was:

$$H_{0F}: \mu_{RFC} = \mu_P$$

The alternative hypothesis was:

$$H_{1F}: \mu_{RFC} \neq \mu_P$$

## **CHAPTER IV FINDINGS**

### **Purpose of the Study**

The purpose of this study was to describe the impact of instructor-led feedback conferences on the level of reflective thought among senior-level students enrolled in a teaching methods course in Agricultural Education. This chapter presents the findings of the study by research objective.

### **Research Objectives**

1. Describe the characteristics of the students (age, academic achievement, program emphasis, and sex).
2. Describe the reflective thinking level of students.
3. Describe the reflective thinking level of students by their characteristics.
4. Compare the effect of reflective feedback conference on students' reflective thought by experimental group.

H<sub>0A</sub>: There will be no difference in composite reflective scores for Clinical Teaching Experience (CTE) 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1A</sub>: There will be a difference in composite reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0B</sub>: There will be no difference in composite reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1B</sub>: There will be a difference in composite reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0C</sub>: There will be no difference in composite reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1C</sub>: There will be a difference in composite reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

H<sub>0D</sub>: There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1D</sub>: There will be a difference in critical reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0E</sub>: There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1E</sub>: There will be a difference in critical reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0F</sub>: There will be no difference in critical reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1F</sub>: There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.

## Findings

### Objective One – Characteristics of Respondents

Objective 1 sought to describe the characteristics (age, cumulative GPA, program emphasis, and sex) of the students. The characteristics of age and cumulative GPA were reported for the placebo and treatment group (see Table 4). The average age overall was approximately 23 years ( $M = 23.14$ ;  $SD = 6.35$ ) with the placebo group being nearly 22 years old ( $M = 21.79$ ;  $SD = 1.12$ ) and the treatment group with a mean age of 24.50 ( $SD = 8.86$ ) years. The range of ages for the overall group was from 20 up to 52 years of age. The mean Cumulative Grade Point Average (GPA) for the overall group was 3.49 ( $SD = 0.40$ ) with the placebo ( $M = 3.45$ ;  $SD = 0.41$ ) and treatment ( $M = 3.52$ ;  $SD = 0.39$ ) showing little variation.

Table 4  
*Students' Average Age and Academic Performance by Experimental Group (n = 28)*

Characteristic	Placebo (n = 14)			Treatment (n = 14)			Overall		
	M	SD	Range	M	SD	Range	M	SD	Range
Age	21.79	1.12	21-24	24.50	8.86	20-52	23.14	6.35	20-52
Cumulative GPA <sup>a</sup>	3.45	0.41	2.56-3.95	3.52	0.39	2.83-4.00	3.49	0.40	2.56-4.00

<sup>a</sup>Possible Range = 0.00 - 4.00

The characteristics of age, cumulative GPA, program emphasis and sex were reported for the placebo and treatment group, as well as overall using frequency and

percents (see Table 5). Continuous data presented in Table 4 were broken into categories in order to use the crosstabs feature of SPSS to compare reflective thinking scores for objective three. When the age of students was broken into categories, 15 (53.57%) of the students were 21 or younger while 13 (46.43%) of the students were 22 or older. Of those students who were receiving the placebo, eight (57.14%) were 21 or younger while six (42.86%) were 22 or older. Of the students who were receiving the treatment, they were split evenly with 50% ( $f = 7$ ) being 21 or younger and 50% ( $f = 7$ ) being 22 or older.

Cumulative GPA was divided into high, moderate, and low categories (see Table 5). Cumulative GPA scores between 0.00 and 3.40 were labeled as low, scores between 3.41 and 3.79 were labeled as moderate, and scores between 3.80 and 4.00 were labeled as high. Overall, eight (28.57%) students had a high cumulative GPA, 11 (39.29%) had a moderate cumulative GPA, and nine (32.14%) had a low cumulative GPA. Academic achievement was fairly evenly distributed across experimental groups with the placebo group having four (28.57%) high cumulative GPA students, five (35.71%) moderate cumulative GPA students and five (35.71%) students in the low group, while the treatment group had four (28.57%) students with a high cumulative GPA, six (42.86%) with a moderate cumulative GPA, and four (28.57%) with a low cumulative GPA.

Of the 28 students in the study, 24 (85.71%) were teaching emphasis and four (14.29%) were leadership emphasis (see Table 5). When split across experimental groups, the placebo group contained three (21.43%) leadership emphasis students and the treatment group contained one (7.14%) student. Teaching emphasis students were also split across placebo ( $f = 11$ ; 78.57%) and treatment ( $f = 13$ ; 92.86%). In terms of sex, the study contained seven (25.00%) males and 21 (75.00%) females with the placebo group

having four (28.57%) males and 10 (71.43%) females while the treatment group had three (21.43%) males and 11 (78.57%) females.

Table 5  
*Frequency of Student Characteristics by Experimental Group (n = 28)*

Characteristic	Placebo (n = 14)		Treatment (n = 14)		Overall	
	f	%	f	%	f	%
<b>Age</b>						
21 or younger	8	57.14	7	50.00	15	53.57
22 or older	6	42.86	7	50.00	13	46.43
<b>Cumulative GPA</b>						
High (3.80 - 4.00)	4	28.57	4	28.57	8	28.57
Moderate (3.41 - 3.79)	5	35.71	6	42.86	11	39.29
Low (0.00 - 3.40)	5	35.71	4	28.57	9	32.14
<b>Program Emphasis</b>						
Leadership	3	21.43	1	7.14	4	14.29
Teaching	11	78.57	13	92.86	24	85.71
<b>Sex</b>						
Male	4	28.57	3	21.43	7	25.00
Female	10	71.43	11	78.57	21	75.00

### **Objective Two: Reflective Thinking**

Objective Two sought to describe the reflective thinking level of students. A scoring rubric identified seven levels of reflection that were hierarchical in nature. The seven levels were: (a) Technical, (b) Descriptive – singular focus, (c) Descriptive -

multifaceted, (d) Dialogic - singular focus, (e) Dialogic – multifaceted, (f) Critically reflective, with an additional category for no response. No response was scored a 0, a technical response was coded a 1, a descriptive response with a singular focus was scored a 3, a descriptive response with multiple foci was scored a 4, a dialogic response (singular focus) was scored a 5, a dialogic response (with multiple foci) was scored a 6, and a critically reflective response was scored a 7. The score of 2 was not used because it would complicate the task of interpreting composite reflection scores.

Table 6 reports the reflective thinking scores given on Question One across the three Clinical Teaching Experiences (CTE) and overall. The first question stated “Do you think your lesson was successful? Why or why not?” CTE 1 had 16 (57.14%) responses that scored a 1 and were, therefore, technical in their reflection. Eleven (39.29%) responses were scored a 3, and one (3.57%) response which scored a 4, making these students descriptive in their reflection. CTE 2 had 13 (46.43%) responses that scored in the technical category. Additionally, there were 10 (35.71%) responses that scored a 3, and five (17.86%) responses that scored a 4 making those students descriptively reflective. CTE 3 had 15 (53.57%) responses that were technically reflective and 13 responses that were descriptive in nature with 11 (39.29%) responses which scored a 3, and two (7.14%) responses that scored a 4. Overall, there were 44 (52.38%) technical responses, 32 (38.10%) singular descriptive responses, and eight (9.52%) multifaceted descriptive responses. There were no students who earned a reflective thinking score in the dialogic or critical categories.



Table 6

*Reflective Thinking Scores on Question One by CTE and Overall (n = 28)*

Reflective Thinking Score <sup>a</sup>	Clinical Teaching Experience						Overall	
	1		2		3			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
0	0	0.00	0	0.00	0	0.00	0	0.00
1	16	57.14	13	46.43	15	53.57	44	52.38
3	11	39.29	10	35.71	11	39.29	32	38.10
4	1	3.57	5	17.86	2	7.14	8	9.52
5	0	0.00	0	0.00	0	0.00	0	0.00
6	0	0.00	0	0.00	0	0.00	0	0.00
7	0	0.00	0	0.00	0	0.00	0	0.00

<sup>a</sup> 0 = no response, 1 = technical, 3 = descriptive (singular), 4 = descriptive (multifaceted), 5 = dialogic (singular), 6 = dialogic (multifaceted), 7 = critical

Table 7 reports the reflective thinking scores for Question Two by CTE and overall. Question Two stated “What alternative teaching methods could you have used on this lesson and how might these have improved the learning process for students, collectively or individually?” CTE 1 had 12 (42.86%) responses that scored a 1, making them non-reflective. There were nine (32.14%) responses that scored a 3, and seven (25.00%) responses that scored a 4, fitting into the descriptive category. Clinical Teaching Experience 2 had 11 (39.29%) technical responses, nine (32.14%) singular descriptive responses that scored a 3, and eight (28.57%) responses that scored a 4, and were multifocal descriptive. CTE 3 had 11 (39.29%) technical responses that scored a 1, 12 (42.86%) responses that scored a 3, and five (17.86%) responses that scored a 4,

making those students descriptive in their reflection. Overall, there were 34 (40.48%) technical responses, 30 (35.71%) singular descriptive responses, and 20 (23.81%) multifocal descriptive responses. No responses were scored as dialogic or critically reflective.

Table 7

*Reflective Thinking Scores on Question Two by CTE and Overall (n = 28)*

Reflective Thinking Score <sup>a</sup>	Clinical Teaching Experience						Overall	
	1		2		3			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
0	0	0.00	0	0.00	0	0.00	0	0.00
1	12	42.86	11	39.29	11	39.29	34	40.48
3	9	32.14	9	32.14	12	42.86	30	35.71
4	7	25.00	8	28.57	5	17.86	20	23.81
5	0	0.00	0	0.00	0	0.00	0	0.00
6	0	0.00	0	0.00	0	0.00	0	0.00
7	0	0.00	0	0.00	0	0.00	0	0.00

<sup>a</sup> 0 = no response, 1 = technical, 3 = descriptive (singular), 4 = descriptive (multifaceted), 5 = dialogic (singular), 6 = dialogic (multifaceted), 7 = critical

The reflective thinking score for Question One were added to the reflective thinking score for the Question Two to create a composite reflection score for each student. For purposes of creating categories, the highest level of reflection attained in answering either question was used. For example, a student with a technical response on Question One and a descriptive response on Question Two would have scored a 4 and

would be categorized as descriptive. These data and are reported by CTE and overall (see Table 8).

For CTE 1, nine students (32.14%) scored a 2 placing them in the non-reflective category. The remaining two-thirds of the group ( $f = 19$ ) were reflective, but not critically reflective with eight (28.57%) students scoring a 4, two (7.14%) responses scoring a 5, four (14.29%) responses scoring a 6, and four scoring a 7. One (3.57%) student achieved a composite score of 8. For CTE 2, five (17.86%) students scored a 2 and were, therefore, considered non-reflective. The remainder of the students scored in the reflective, but not critically reflective category with 10 (35.71%) students scoring a 4, four (14.29%) students scoring a 5, four (14.29%) students scoring a 6, one (3.57%) student scoring a 7, and four (14.29%) students scoring an 8. For CTE 3, eight (28.57%) students scored a 2 and are considered non-reflective. The remaining 20 (71.43%) students were reflective, but not critically reflective. Specifically, nine (32.14%) students scored a 4, one (3.57%) student scored a 5, five (17.86%) students scored a 6, four (14.29%) scored a 7, and one (3.57%) student scored an 8. Overall, there were 22 (26.19%) students who were non-reflective, and 56 (73.81%) of the students who were reflective, but not critically reflective.

Table 8

*Composite Reflection Scores by CTE and Overall (n = 28)*

Reflective Thinking Score <sup>a</sup>	Clinical Teaching Experience						Overall	
	1		2		3			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
0	0	0.00	0	0.00	0	0.00	0	0.00
1	0	0.00	0	0.00	0	0.00	0	0.00
2	9	32.14	5	17.86	8	28.57	22	26.19
3	0	0.00	0	0.00	0	0.00	0	0.00
4	8	28.57	10	35.71	9	32.14	27	32.14
5	2	7.14	4	14.29	1	3.57	7	8.33
6	4	14.29	4	14.29	5	17.86	13	15.48
7	4	14.29	1	3.57	4	14.29	9	10.71
8	1	3.57	4	14.29	1	3.57	6	7.14
9	0	0.00	0	0.00	0	0.00	0	0.00
10	0	0.00	0	0.00	0	0.00	0	0.00
11	0	0.00	0	0.00	0	0.00	0	0.00
12	0	0.00	0	0.00	0	0.00	0	0.00
13	0	0.00	0	0.00	0	0.00	0	0.00
14	0	0.00	0	0.00	0	0.00	0	0.00

<sup>a</sup> 0 = missing, 1-2 = non-reflective, 3- 12 = reflective, 13-14 = critically reflective

The composite reflection scores across CTE are displayed in Table 9. For CTE 1, the average score was 4.29 ( $SD = 1.96$ ). For CTE 2, the average composite reflection score was 4.75 ( $SD = 1.90$ ), and for CTE 3 the average score was 4.39 ( $SD = 1.93$ ).

Table 9

*Composite Reflection Scores by CTE (n = 28)*

Reflective Thinking Score	Clinical Teaching Experience					
	1		2		3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Composite	4.29	1.96	4.75	1.90	4.39	1.93

Table 10 reports the critical reflection scores by CTE and overall. Question Three stated “What moral and/or ethical concerns occurred / could occur as a result of the lesson. Justify your answer.” These answers could be placed into one of two categories: either the student was critically reflective or not. There was also a category for no response. For CTE 1, every student ( $f = 28$ , 100%) received a score of 1, placing them in the not critically reflective category. This was true for CTE 2 and CTE 3, except that two (7.14%) students did not respond during CTE 2 and one (3.57%) student did not respond during CTE 3. Overall, every student who responded ( $f = 81$ , 96.43%) scored as being not critically reflective while three students (3.57%) did not respond.

Table 10

*Categorical Critical Reflective Score by CTE (n = 28)*

Reflective Thinking Level	Clinical Teaching Experience						Overall	
	1		2		3			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
No response	0	0.00	2	7.14	1	3.57	3	3.57
Not critically reflective	28	100.00	26	92.86	27	96.43	81	96.43
Critically reflective	0	0.00	0	0.00	0	0.00	0	0.00

Some students responded to the Question Three but were not reflective while other students gave responses which were much more complex yet not still critically reflective. Table 11 displays the scoring of the same responses to Question Three with the addition of a category for responses which were seen as “approaching critically reflective”. There were eight (28.57%) responses during CTE 1 which scored as approaching critically reflective. There were six (21.43%) responses during CTE 2 and five (17.85%) responses during CTE 3 categorized as approaching critically reflective. Overall, 19 (22.62%) of the responses were approaching critically reflective.

Table 11

*Categorical Composite Reflection Scores with Addition of “Approaching Critically Reflective” Category (n = 28)*

Reflective Thinking Level	Clinical Teaching Experience						Overall	
	1		2		3			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
No response	0	0.00	2	7.14	1	3.57	3	3.57
Not Critically Reflective	20	71.43	20	71.43	22	78.57	62	73.81
Approaching Critically Reflective	8	28.57	6	21.43	5	17.86	19	22.62
Critically Reflective	0	0.00	0	0.00	0	0.00	0	0.00

### **Objective Three: Reflective Thinking Level by Characteristic**

Objective Three sought to describe the reflective thinking level of students by characteristics. Data from CTE 1 using composite score categories as reported across the age categories are shown in Table 12. The categories of no response, non-reflective,

reflective, and critically reflective were created by coding in Table 6. Of the students who were 21 or younger there were three (10.71%) who were non-reflective and 12 (42.86%) who were reflective. In the group aged 22 or older, there were six (21.43%) who were non-reflective and seven (25.00%) who were reflective. A Kendall's tau-b was used because the zeros in categories of no response and critically reflective allowed for a 2x2 matrix of data. The Kendall's tau-b indicated that in CTE 1, there was a low, negative correlation ( $\tau_b = -0.28, p = .13$ ) between the students' age and their composite reflection score indicating that the younger students tend to be slightly more reflective.

Table 12

*CTE 1 Categorical Reflection of Composite Score by Age (n = 28)*

Age <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	3	10.71	12	42.86	0	0.00
22 or older	0	0.00	6	21.43	7	25.00	0	0.00

*Note.* Kendall's Tau-b = -0.28,  $p = .13$

<sup>a</sup>Coding: 0 = 21 or younger, 1 = 22 or older  
 $p < .10$

For CTE 1, composite reflection score was reported by cumulative GPA (see Table 13). Of the students with a high cumulative GPA, three (10.71%) were non-reflective while five (17.86%) were reflective. In the moderate cumulative GPA category, four (14.29%) students were non-reflective while seven (25.00%) were reflective. In the low cumulative GPA category, two (7.14%) students were non-reflective while seven (25.00%) were reflective. A Kendall's tau-c was calculated instead of a tau-b because of

the two-by-three nature of the data. There is a low, negative correlation ( $\tau_c = -0.13$ ;  $p = .48$ ) between cumulative GPA and composite reflection indicating that the lower the students GPA, the more reflective they tend to be.

Table 13

*CTE 1 Categorical Reflection of Composite Score by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	3	10.71	5	17.86	0	0.00
Moderate	0	0.00	4	14.29	7	25.00	0	0.00
Low	0	0.00	2	7.14	7	25.00	0	0.00

*Note.* Kendall's Tau-c = -0.13;  $p = .48$

<sup>a</sup>Coding: 0 = Low, 1 = Moderate, 2 = High

$p < .10$

Table 14 displays the data for composite reflection score by program emphasis (leadership and teaching). Of the leadership students, two (7.14%) were non-reflective and two (7.14%) were reflective. Of the teaching emphasis students, seven (25.00%) were non-reflective while 17 (60.71%) were reflective. Kendall's tau-b was calculated and indicates a low, positive correlation ( $\tau_b = 0.16$ ;  $p = .45$ ) between composite reflection and program emphasis with the teaching emphasis students tending to show a higher composite reflection score on CTE 1.



Table 14

*CTE 1 Categorical Reflection of Composite Score by Program Emphasis (n = 28)*

Program Emphasis <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	0	0.00	2	7.14	2	7.14	0	0.00
Teaching	0	0.00	7	25.00	17	60.71	0	0.00

*Note.* Kendall's Tau-b = 0.16; *p* = .45

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching

*p* < .10

CTE 1 was also analyzed by sex (see Table 15). Of the male students in the study, five (14.29%) were non-reflective while two (7.14%) were reflective. Of the females in the group, four (14.29%) were non-reflective while 17 (60.71%) were reflective. A Kendall's tau-b was calculated and a moderate, positive correlation ( $\tau_b = 0.49$ ; *p* = .02) was found with females tending to show a higher composite reflection score on CTE 1.

Table 15

*CTE 1 Categorical Reflection of Composite Score by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	0	0.00	5	14.29	2	7.14	0	0.00
Female	0	0.00	4	14.29	17	60.71	0	0.00

*Note.* Kendall's Tau-b = 0.49; \**p* = .02

<sup>a</sup> 0 = Male, 1 = Female

\**p* < .10

The composite reflection scores for CTE 2 were analyzed by age (see Table 16). Of the students who were 21 or younger, all but one was reflective (*f* = 14, 50.00%) while

the 22 or older group was divided with four (14.29%) being non-reflective and nine (32.14%) being reflective. A moderate, negative correlation ( $\tau_b = -0.31$ ;  $p = .09$ ) was found indicating that the younger students tended to score higher on composite reflection in CTE 2.

Table 16  
*CTE 2 Categorical Reflection of Composite Score by Age (n = 28)*

Age <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	1	3.57	14	50.00	0	0.00
22 or older	0	0.00	4	14.29	9	32.14	0	0.00

*Note.* Kendall's Tau-b = -.031, \* $p = .09$

<sup>a</sup>Coding: 0 = 21 or younger, 1 = 22 or older

\* $p < .10$

The composite reflection scores of CTE 2 were analyzed by Cumulative GPA (see Table 17). All of the students with a high cumulative GPA ( $f = 8$ , 28.57%) were reflective. Of the students with a moderate cumulative GPA, four (14.29%) were non-reflective while seven (25.00%) were reflective. All but one (3.57%) of the students with a low cumulative GPA was reflective ( $f = 8$ , 28.57%). A negligible, positive correlation ( $\tau_c = 0.07$ ;  $p = .51$ ) was found between cumulative GPA and composite reflection during CTE 2 indicating that students with a higher cumulative GPA tended to be more reflective.

Table 17

*CTE 2 Categorical Reflection of Composite Score by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	0	0.00	8	28.57	0	0.00
Moderate	0	0.00	4	14.29	7	25.00	0	0.00
Low	0	0.00	1	3.57	8	28.57	0	0.00

Note. Kendall's Tau-c = 0.07,  $p = .51$

<sup>a</sup>Coding: 0 = Low, 1 = Moderate, 2 = High

$p < .10$

Table 18 displays composite reflection scores as observed by program emphasis. All ( $f = 4$ , 14.29%) of the leadership students were reflective. Of the teaching emphasis students, five (17.86%) were non-reflective while 19 (67.86%) were reflective. A low, negative correlation ( $\tau_b = -0.19$ ;  $p = .07$ ) was found indicating that leadership emphasis students tend to have a higher composite reflection score than teaching emphasis students.

Table 18

*CTE 2 Categorical Reflection of Composite Score by Program Emphasis (n = 28)*

Program emphasis <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	0	0.00	0	0.00	4	14.29	0	0.00
Teaching	0	0.00	5	17.86	19	67.86	0	0.00

Note. Kendall's Tau-b = -0.19,  $*p = .07$

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching

$*p < .10$

Table 19 displays CTE 2 composite reflection scores divided by sex. Of the males in the study, two (7.14%) were non-reflective while five (17.86%) were reflective. Of the females, three (10.71%) were non-reflective while 18 (64.29%) were reflective. A low, positive correlation ( $\tau_b = 0.16$ ;  $p = .45$ ) was found between composite reflection and sex, indicating that females tended to have a higher composite reflection score during CTE 2.

Table 19

*CTE 2 Categorical Reflection of Composite Score by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	0	0.00	2	7.14	5	17.86	0	0.00
Female	0	0.00	3	10.71	18	64.29	0	0.00

*Note.* Kendall's Tau-b = 0.16,  $p = .45$

<sup>a</sup>Coding: 0 = Male, 1 = Female

$p < .10$

Composite reflection by age for CTE 3 is shown in Table 20. The groups were virtually the same with four (14.29%) non-reflective students in both the 21 or younger group and the 22 or older group. In the reflective category, there were 11 (39.29%) students 21 or younger and nine (32.14%) students 22 or older. There was a negligible, negative correlation ( $\tau_b = -0.05$ ;  $p = .81$ ) found indicating slightly more reflection from the younger group.

Table 20

*CTE 3 Categorical Reflection of Composite Score by Age (n = 28)*

Age <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	4	14.29	11	39.29	0	0.00
22 or older	0	0.00	4	14.29	9	32.14	0	0.00

*Note.* Kendall's Tau-b = -0.05,  $p = .81$

<sup>a</sup>Coding: 0 = 21 or younger, 1 = 22 or older

$p < .10$

Composite reflection scores are displayed by cumulative GPA for CTE 3 (see Table 21). There were three (10.71%) non-reflective students with a low cumulative GPA and three (10.71%) more non-reflective students with a moderate cumulative GPA. Two (7.14%) students with a high cumulative GPA were non-reflective. Of the students who were reflective, six (21.43%) had a high cumulative GPA, eight (28.57%) had a moderate GPA and six (21.43%) had a low cumulative GPA. A negligible, positive correlation ( $\tau_c = 0.07$ ;  $p = .70$ ) was found indicating that students with a higher cumulative GPA tended to have slightly higher composite reflection scores during CTE 3.

Table 21

*CTE 3 Categorical Reflection of Composite Score by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	2	7.14	6	21.43	0	0.00
Moderate	0	0.00	3	10.71	8	28.57	0	0.00
Low	0	0.00	3	10.71	6	21.43	0	0.00

*Note.* Kendall's Tau-c = 0.07,  $p = .70$

<sup>a</sup>Coding: 0 = Low, 1 = Moderate, High = 2

$p < .10$

Table 22 displays composite reflection by program emphasis for CTE 3. All four of the leadership emphasis students (14.29%) were reflective. Of the teaching emphasis students, one-fifth ( $f = 8$ , 28.57%) were non-reflective while four-fifths ( $f = 16$ , 27.14%) were reflective. A low, negative correlation ( $\tau_b = -0.26$ ;  $p = .04$ ) was found indicating that leadership students tended to show a higher composite reflection score during CTE 3 than teaching emphasis students.

Table 22

*CTE 3 Categorical Reflection of Composite Score by Program Emphasis (n = 28)*

Program Emphasis <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	0	0.00	0	0.00	4	14.29	0	0.00
Teaching	0	0.00	8	28.57	16	27.14	0	0.00

*Note.* Kendall's Tau-b = -0.26,  $*p = .04$

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching

$*p < .10$

Composite reflection by sex for CTE 3 is displayed in Table 23. There were two (7.14%) non-reflective males and five (17.86%) reflective males. Of the females, six (21.43%) were non-reflective and 15 (53.57%) were reflective. There was no relationship ( $\tau_b = 0.00$ ;  $p = 1.00$ ) found between sex and composite reflection for CTE 3.

Table 23

*CTE 3 Categorical Reflection of Composite Score by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Non-Reflective		Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	0	0.00	2	7.14	5	17.86	0	0.00
Female	0	0.00	6	21.43	15	53.57	0	0.00

*Note.* Kendall's Tau-b = 0.00,  $p = 1.00$

<sup>a</sup>Coding: 0 = Male, 1 = Female

$p < .10$

Table 24 displays critical reflection as divided across the age groups for CTE 1. All of the students were not critically reflective with 15 (53.57%) being 21 or younger and 13 (46.43%) being 22 or older. Due to a lack of variance, a relationship statistic was not calculated.

Table 24

*CTE 1 Critical Reflection Scores by Age (n = 28)*

Age <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	15	53.57	0	0.00
22 or older	0	0.00	13	46.43	0	0.00

<sup>a</sup> Coding: 0 = 21 or younger, 1 = 22 or older

Critical reflection as divided across student cumulative GPA for CTE 1 is displayed in Table 25. None of the students were critically reflective, regardless of cumulative GPA. There were eight (28.57%) students with a high cumulative GPA, 11 (39.29%) with a moderate GPA and nine (32.14%) with a low cumulative GPA who were all scored as not critically reflective. Due to a lack of variance, a relationship statistic was not calculated.

Table 25

*CTE 1 Critical Reflection Scores by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	8	28.57	0	0.00
Moderate	0	0.00	11	39.29	0	0.00
Low	0	0.00	9	32.14	0	0.00

<sup>a</sup> Coding: 0 = Low, 1 = Moderate, 2 = High



Critical reflection by program emphasis for CTE 1 showed no variance across groups (see Table 26). None of the students were critically reflective with four (14.29%) of those students being leadership emphasis while 24 (85.71%) of those students were teaching emphasis. Due to a lack of variance, a relationship statistic was not calculated.

Table 26

*CTE 1 Critical Reflection Scores by Program Emphasis (n = 28)*

Program Emphasis <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	0	0.00	4	14.29	0	0.00
Teaching	0	0.00	24	85.71	0	0.00

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching

Critical reflection scores by sex are displayed in Table 27 for CTE 1. None of the students, regardless of sex, were scored as critically reflective. Seven (25.00%) males and 21 (75.00%) females were among the group. Due to a lack of variance, a relationship statistic was not calculated.

Table 27

*CTE 1 Critical Reflection Scores by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	0	0.00	7	25.00	0	0.00
Female	0	0.00	21	75.00	0	0.00

<sup>a</sup>Coding: 0 = Male, 1 = Female

Table 28 displays critical reflection scores for CTE 2 divided across age groups. A majority (92.86%) of the students were not critically reflective with 15 (53.57%) of these students being 21 or younger and 11 (39.29%) of them being 22 or older. There were two students (7.14%) who did not respond to the question and they were both in the 22 and older group. There was a moderate, negative correlation ( $\tau_b = -0.38$ ;  $p = .02$ ) between these variables indicating younger students were more likely to give a not critically reflective response.

Table 28  
*CTE 2 Critical Reflection Scores by Age (n = 28)*

Age <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	15	53.57	0	0.00
22 or older	2	7.14	11	39.29	0	0.00

*Note.* Kendall's Tau-b = -0.38, \* $p = .02$   
<sup>a</sup> Coding: 0 = 21 or younger, 1 = 22 or older  
 \* $p < .10$

Table 29 displays critical reflection for CTE 2 across cumulative GPA. There was one (3.57%) student with a moderate GPA and one (3.57%) with a low cumulative GPA who did not respond to the question. None of the other students ( $f = 26$ , 92.85%) were critically reflective with eight (28.57%) students having a high cumulative GPA, 10 (35.71%) students having a moderate GPA and eight (28.57%) students having a low cumulative GPA. There was a low, positive correlation ( $\tau_c = 0.21$ ;  $p = .12$ ) found

indicating students with a high cumulative GPA were more likely to respond with a not critically reflective response.

Table 29

*CTE 2 Critical Reflection Scores by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	8	28.57	0	0.00
Moderate	1	3.57	10	35.71	0	0.00
Low	1	3.57	8	28.57	0	0.00

*Note.* Kendall's Tau-c = 0.21,  $p = .12$

<sup>a</sup>Coding: 0 = Low, 1 = Moderate, 2 = High

$p < .10$

Critical reflection by program emphasis is reported for CTE 2 in Table 30. One (3.57%) leadership emphasis and one (3.57%) teaching emphasis student did not respond to the question. The remaining students were scored as not critically reflective with three (10.71%) of those students being leadership emphasis and 23 (82.14%) of them being teaching emphasis. A low, negative correlation ( $\tau_b = -0.11$ ;  $p = .71$ ) was found indicating that leadership students tended to give a not critically reflective answer more often than teaching emphasis students.

Table 30

*CTE 2 Critical Reflection Scores by Program emphasis (n = 28)*

Program Emphasis <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	1	3.57	3	10.71	0	0.00
Teaching	1	3.57	23	82.14	0	0.00

Note. Kendall's Tau-b = -0.11,  $p = .71$

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching  
 $p < .10$

Data for critical reflection by sex are displayed in Table 31. There were two (7.14%) males who provided no response during CTE 2. There were five (17.86%) males who provided a not critically reflective response. None of the 21 (75.00%) females provided a critically reflective response. A low, positive correlation ( $\tau_b = 0.29$ ;  $p = .17$ ) was found indicating that females tended to be more critically reflective during CTE 2.

Table 31

*CTE 2 Critical Reflection Scores by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	2	7.14	5	17.86	0	0.00
Female	0	0.00	21	75.00	0	0.00

Note. Kendall's Tau-b = 0.29,  $p = .17$

<sup>a</sup>Coding: 0 = Male, 1 = Female  
 $p < .10$

Table 32 displays data for critical reflection by age for CTE 3. All of the students age 21 or younger ( $f = 15, 53.57\%$ ) provided a not critically reflective response. Of the students 22 and older, one (3.57%) provided no response while 12 (42.86%) provided a not critically reflective response. A low, negative correlation ( $\tau_b = -0.29; p = .08$ ) was found that indicates the younger students tended to give more not critically reflective responses during CTE 3.

Table 32  
*CTE 3 Critical Reflection Scores by Age (n = 28)*

Age <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
21 or younger	0	0.00	15	53.57	0	0.00
22 or older	1	3.57	12	42.86	0	0.00

*Note.* Kendall's Tau-b = -0.29, \* $p = .08$

<sup>a</sup>Coding: 0 = 21 or younger, 1 = 22 or older

\* $p < .10$

Data for critical reflection by cumulative GPA for CTE 3 are displayed in Table 33. None of the students with a high cumulative GPA ( $f = 8, 28.57\%$ ) were critically reflective. None of the students ( $f = 11, 39.29\%$ ) with a moderate cumulative GPA were critically reflective. Of the students with a low cumulative GPA, one (3.57%) gave no response while eight (28.57%) were not critically reflective. A low, negative correlation ( $\tau_c = -0.22; p = .13$ ) was found indicating that the students with a lower cumulative GPA were more likely to give a not critically reflective answer.

Table 33

*CTE 3 Critical Reflection Scores by Cumulative GPA (n = 28)*

CGPA <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
High	0	0.00	8	28.57	0	0.00
Moderate	0	0.00	11	39.29	0	0.00
Low	1	3.57	8	28.57	0	0.00

Note. Kendall's Tau-c = -0.22,  $p = .13$

<sup>a</sup>Coding: 0 = Low, 1 = Moderate, 2 = High  
 $p < .10$

Table 34 displays critical reflection divided by leadership and teaching emphasis students for CTE 3. Of the four leadership emphasis students, one (3.57%) gave no response while three (10.71%) were not critically reflective. All of the 24 (85.71%) teaching emphasis students were not critically reflective. A low, positive correlation ( $\tau_b = 0.11$ ;  $p = .71$ ) was found between these variables indicating that teaching emphasis students are more likely to give a not critically reflective response.

Table 34

*CTE 3 Critical Reflection Scores by Program Emphasis (n = 28)*

Program Emphasis <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Leadership	1	3.57	3	10.71	0	0.00
Teaching	0	0.00	24	85.71	0	0.00

Note. Kendall's Tau-b = 0.11,  $p = .71$

<sup>a</sup>Coding: 0 = Leadership, 1 = Teaching  
 $p < .10$

The data in Table 35 display critical reflection by sex for CTE 3. Of the males in the study, one (3.57%) gave no response while six (21.43%) were not critically reflective. All 21 (75.00%) of the females were not critically reflective. A low, positive correlation ( $\tau_b = 0.17$ ;  $p = .42$ ) was found between the variables indicating that females were more likely to give a not critically reflective response during CTE 3.

Table 35  
*CTE 3 Critical Reflection Scores by Sex (n = 28)*

Sex <sup>a</sup>	No Response		Not Critically Reflective		Critically Reflective	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	1	3.57	6	21.43	0	0.00
Female	0	0.00	21	75.00	0	0.00

*Note.* Kendall's Tau-b = 0.17,  $p = .42$

<sup>a</sup>Coding: 0 = Male, 1 = Female

$p < .10$

#### **Objective Four – Reflective Thinking Level by Conference**

Objective Four sought to compare the effect of reflective feedback conference on students' reflective thought by experimental group (placebo and treatment). Data for the first three hypotheses appears in Table 36. Null hypothesis A stated, "There will be no difference in composite reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not." The alternative stated, "There will be a difference in composite reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not." For CTE 1, the placebo

group averaged a 4.43 ( $SD = 1.99$ ) and the treatment group averaged a 4.14 ( $SD = 1.99$ ). An independent samples  $t$ -test indicated this difference was not statistically significant ( $t = 0.38, p = .71$ ). Levene's test was performed and since the result was not significant, data reported here are for "Equal Variances Assumed." A Cohen's  $d$  was calculated and showed a negligible effect size. Null hypothesis A was retained (see Table 36).

Table 36

*CTE Composite Reflective Scores by Experimental Group (n = 28)*

Clinical Teaching Experience	Placebo (n = 14)		Treatment (n = 14)		t-value	p-value	Cohen's d
	M	SD	M	SD			
1	4.43	1.99	4.14	1.99	0.38	.71	0.15
2	5.14	1.46	4.36	2.24	1.10	.28	0.43
3	4.21	1.89	4.57	2.03	-0.48	.63	0.19

\* $p < .10$

Null hypothesis B stated, "There will be no difference in composite reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not" while alternative hypothesis B stated, "There will be a difference in composite reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not." For CTE 2, the placebo group had an average score of 5.14 ( $SD = 1.46$ ) while the treatment group had a 4.36 ( $SD = 2.24$ ). An independent samples  $t$ -test indicated that this difference was not statistically significant ( $t = 1.10, p = .28$ ). Levene's test was performed and since the result was not significant, data reported here are for "Equal Variances Assumed." Cohen's  $d$  showed this held a small effect size. Therefore, null hypothesis B was retained (see Table 36).



Null hypothesis C stated, “There will be no difference in composite reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not” and alternative hypothesis C stated, “There will be a difference in composite reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not”. For CTE 3, the placebo group had an average score of 4.21 ( $SD = 1.89$ ) while the treatment group had an average score of 4.57 ( $SD = 2.03$ ). An independent samples  $t$ -test indicated that this difference was not statistically significant ( $t = -0.48, p = .63$ ). Levene’s test was performed and since the result was not significant, data reported here are for “Equal Variances Assumed.” Cohen’s  $d$  showed that the effect size was negligible. Therefore, null hypothesis C was not rejected (see Table 36).

Data for hypotheses D-F are displayed in Table 37. Null hypothesis D states, “There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not” and the alternative stated, “There will be a difference in critical reflective scores for CTE 1 between students who have had a reflective feedback conference and those who have not.” For both treatment and placebo, every student scored a 1 on CTE 1. There was no variance, therefore, no  $t$ -value was calculated (see Table 37).

Table 37

*CTE Critical Reflective Scores by Experimental Group (n = 28)*

Clinical Teaching Experience	Placebo (n=14)		Treatment (n = 14)		<i>t</i> -value	<i>p</i> -value	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1	1.00	0.00	1.00	0.00	-	-	-
2	0.93	0.27	0.93	0.27	0.00	1.00	0.00
3	0.93	0.27	1.00	0.00	-1.00	-.07*	0.38

\**p* < .10

Null hypothesis E stated, “There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not” and the alternative stated, “There will be a difference in critical reflective scores for CTE 2 between students who have had a reflective feedback conference and those who have not”. For CTE 2, the placebo group had an average score of 0.93 (*SD* = 0.27) as did the treatment group. This lack of variance meant that the *t*-value was 0.00 (see Table 37).

For hypothesis F, the null stated, “There will be no difference in critical reflective scores for CTE 3 between the students who have had a reflective feedback conference and those who have not” and the alternative stated, “There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.” For CTE 3, the placebo group had an average score of 0.93 (*SD* = 0.27) while the treatment group had an average score of 1.00 (*SD* = 0.00). An independent samples *t*-test was calculated and found a statistically significant difference (*t* = -1.00, *p* = -.07). Levene's test was performed and since the result was significant, data reported here are for “Equal Variances Not Assumed.” A Cohen's *d* was

calculated and showed a small effect size. Therefore, the null was rejected in favor of the alternative (see Table 37).

## **CHAPTER V SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS**

### **Purpose of the Study**

The purpose of the study was to describe the impact of instructor-led reflective feedback conferences on the level of reflective thought among senior-level students enrolled in a teaching methods course in Agricultural Education.

### **Research Objectives**

- 1 - Describe the characteristics of the students (age, academic achievement, program emphasis, and sex).
- 2 - Describe the reflective thinking level of students.
- 3 - Describe the reflective thinking level of students by their characteristics.
- 4 - Compare the effect of reflective feedback conference on students' reflective thought by experimental group.

$H_{0A}$ : There will be no difference in composite reflective scores for Clinical Teaching Experience 1 between the students who have had a reflective feedback conference and those who have not.

$H_{1A}$ : There will be a difference in composite reflective scores for Clinical Teaching Experience 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0B</sub>: There will be no difference in composite reflective scores for Clinical Teaching Experience 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1B</sub>: There will be a difference in composite reflective scores for Clinical Teaching Experience 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0C</sub>: There will be no difference in composite reflective scores for Clinical Teaching Experience 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1C</sub>: There will be a difference in composite reflective scores for Clinical Teaching Experience 3 between students who have had a reflective feedback conference and those who have not.

H<sub>0D</sub>: There will be no difference in critical reflective scores for Clinical Teaching Experience 1 between the students who have had a reflective feedback conference and those who have not.

H<sub>1D</sub>: There will be a difference in critical reflective scores for Clinical Teaching Experience 1 between students who have had a reflective feedback conference and those who have not.

H<sub>0E</sub>: There will be no difference in critical reflective scores for Clinical Teaching Experience 2 between the students who have had a reflective feedback conference and those who have not.

H<sub>1E</sub>: There will be a difference in critical reflective scores for Clinical Teaching Experience 2 between students who have had a reflective feedback conference and those who have not.

H<sub>0F</sub>: There will be no difference in critical reflective scores for Clinical Teaching Experience 3 between the students who have had a reflective feedback conference and those who have not.

H<sub>1F</sub>: There will be a difference in critical reflective scores for Clinical Teaching Experience 3 between students who have had a reflective feedback conference and those who have not.

### **Research Design**

This study employed a post-test only comparison group design. Campbell and Stanley (1963) stated that the pre-test is not essential to a true experimental design. Experimental design was chosen to investigate the effect of an instructor-led feedback conference on level of reflective thinking, control for extraneous variables, and look for alternative causes as well as because the design of the course offered the opportunity to implement this design easily. Experimental designs allow for the manipulation of the independent variable and the ability to attribute the outcome of an experiment to the treatment. Experiments do not necessarily prove causation, but do offer a higher level of rigor in controlling alternative explanations (Ary et al., 2010).

The term comparison group was chosen instead of control group because the non-treatment group was receiving a placebo feedback conference and the term control group implies that the non-treatment group was receiving no treatment at all.

The dependent variable in this study was the reflective thinking level exhibited by methods students. Reflective thinking was measured by coding student responses to open-ended questions. Reflective thinking was operationalized by Hatton and Smith (1995) into five levels. The first four levels (non-reflective, descriptive, dialogic and critical) were used in this study.

The independent variable in this study was the instructor-led feedback conference. Students were part of an intact methods course and were randomly assigned to either the treatment or placebo group. Students received either a reflective feedback conference or a placebo feedback conference.

## **Treatment and Procedures**

### **Treatment**

The treatment group received a reflective instructor-led feedback conference using the protocols reported in Appendix B. The placebo group received a non-reflective instructor-led feedback conference that focused on a technical aspect of the course objectives (i.e. lesson planning, interest approaches, and choosing instructional methods), but did not address the student's teaching ability (see Appendix C). Both conferences occurred in the days following the clinical teaching experience and the conferences lasted approximately 30 minutes for participants in each group.

### **Procedures**

Agricultural Education 4330/7330 is a teaching methods course, typically completed by students during the fall of their senior year before student teaching in the

spring. Students are assigned to three clinical teaching experiences. The first is a demonstration. The second is an interest approach. The third is an application or activity. There is a final assignment which is a practical experience whereby the students serve as the instructors for a merit badge seminar for area Boy Scouts ®. Since this activity is so different from the others, it was excluded from the treatment and thus discussion is offered only on the procedures for the first three clinical teaching experiences.

The data collection process was consistent for all participants, except as it pertains to the treatment during the conference. First, students completed their assigned lesson plans and submitted them one week prior to the presentation. This was graded and returned to them with enough time for them to have made corrections if necessary. They completed the lesson with their peers serving as students and their instructor evaluating their performance. This lesson was also video recorded and provided to the student for purposes of self-reflection. Upon completion, each student scheduled a follow-up conference with their assigned instructor, within the days immediately following their presentation.

To this conference, the student brought a list of perceived teaching positives and negatives from their lesson. The conference followed either the protocol for the reflective instructor-led feedback conference (see Appendix B) or the protocols for the instructor-led placebo feedback conference (see Appendix C). The reflective instructor-led feedback protocol was created to spiral the thought process of the participants into higher levels of reflective thought.



## **Population**

The intact purposive sample was senior-level students in an agricultural education program at the University of Missouri. The students were enrolled in Ag Ed 4330/7330 (Teaching Agriculture Subjects) during the fall of 2009 ( $n = 28$ ). This group included both preservice teachers ( $n = 24$ ) and non-teaching (leadership) emphasis ( $n = 4$ ) students.

## **Instrumentation**

One instrument was used to collect the data for the study. This instrument was developed using a large compiled list of possible reflective questions. These original questions were compiled from a review of sources and narrowed down by a panel of experts to three reflective questions.

Students were given a paper copy of the instrument upon completion of their conference. The instrument was printed on yellow paper with one question on the front side of each page to allow participants room to write. The instructions were included at the top of the first page and indicated that students needed to handwrite their answers. This was for consistency and to attempt to get honest, journal-like answers. The directions also indicated that they should return the form the next time they saw their instructor in class in order to encourage them to perform their reflections in close proximity to the time of the feedback conference. This instrument was subject to measures of validity and reliability.

Face and content validity for this instrument was insured by a review from a panel of experts ( $N = 5$ ). The one researcher coding responses performed all of the coding for

the three rounds at the end of the collection period using a rubric to ensure intra-rater reliability. A recoding was also performed by the researcher and correlations calculated to ensure intra-rater reliability.

### **Data Collection**

Basic descriptive data (age, sex, academic achievement, program emphasis) were collected from student academic records. Academic achievement was operationalized as cumulative GPA for purposes of this study.

All conferences were audio recorded. Upon completion of the conference, students were given the instrument with three reflective questions (see Appendix E) to which they wrote handwritten responses. Explicit instructions were given. The students were told to be reflective. Each question was read or paraphrased so they the students clearly understood the expectations. In order to allow time for deep reflection and provide time to absorb written peer and instructor feedback, students were told to submit the form during the next class session. Grades were returned to the students after their reflection was submitted. This was repeated for rounds two and three. Non-response error was not a factor since all students were required to complete the form.

### **Data Analysis**

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0 computer program for Windows. The alpha level was established *a priori* at .10. The magnitudes for relationships were interpreted using Davis' (1971) conventions. Interpretation of effect size for correlations was done using Thalheimer and Cook's

(2003) descriptors for describing the relative size of Cohen's  $d$ . Data analysis methods were selected as a result of determining the scales of measurement for the variables.

To complete research objective one, descriptive statistics were reported to analyze the characteristics of the students in Ag Ed 4330 (Teaching Agriculture Subjects). Specifically, frequency counts and percentages were used for nominal and ordinal data. Characteristics analyzed included sex, and program emphasis. Means, standard deviations, and ranges were used to describe continuous data. These characteristics included age and academic achievement, as operationalized by cumulative GPA.

To complete research objective two, frequency counts, percentages, means and standard deviations were used. For objective three, the crosstabs feature of SPSS was used as well as Kendall's Tau-b for 2x2 matrices of data and Kendall's Tau-c for 2x3 data. For objective four, an independent samples  $t$ -test was used to test each hypothesis and Cohen's  $d$  was used to interpret effect size.

## **Summary of the Findings**

### ***with* Conclusions, Implications, and Recommendations**

Shadish et al. (2002) argued that conclusions that are made from a non-random sample may be generalized to other groups beyond the one being studied. Therefore, the author contends that the conclusions drawn here may generalize to other units, treatments, outcomes, and settings.

### **Objective One: Characteristics of Respondents**

The characteristics were reported overall as well as by placebo and treatment group. The average age overall is approximately 23 years ( $M = 23.14$ ,  $SD = 6.35$ ). The mean Cumulative Grade Point Average (GPA) for the overall group was 3.49 ( $SD = 0.40$ ). Of the 28 students in the study, 24 (85.71%) were teaching emphasis and four (14.29%) were leadership emphasis. In terms of sex, the study contained seven (25.00%) males and 21 (75.00%) females.

The placebo group had an average age of nearly 22 years ( $M = 21.79$ ,  $SD = 1.12$ ). The placebo group had a cumulative GPA of 3.45 ( $SD = 0.41$ ). The group contained three (21.43%) leadership emphasis students and 11 teaching emphasis students (78.57%). The placebo group contained four (28.57%) males and 10 (71.43%) females.

The treatment group had a mean age of 24.50 ( $SD = 8.86$ ) years. The cumulative GPA of the treatment group was 3.52 ( $SD = 0.39$ ). The treatment contained one (7.14%) leadership student and 13 (92.86%) teaching emphasis students. There were three (21.43%) males and 11 (78.57%) females in the treatment group.

On average, the students enrolled in Ag Ed 4330/7330 are approximately 23 years old with a mean Cumulative GPA of 3.49. Two thirds are female and all but four students are teaching emphasis. On average the placebo group is nearly 22 years old with a mean GPA of 3.45. The placebo group contains three leadership emphasis students and 11 teaching emphasis with four males and 10 females. The treatment group, on average, is nearly 25 years old and has a mean GPA of 3.52. The treatment group contains one leadership student and 13 teaching emphasis students with three males and 11 females.

## **Objective Two: Reflective Thinking**

For CTE 1, nine students (32.14%) scored a 2, which placed them in the non-reflective category. The remaining two-thirds of the group ( $f = 19$ ) were reflective, but not critically reflective with eight (28.57%) students scoring a 4, two (7.14%) responses scoring a 5, four (14.29%) responses scoring a 6, and four scoring a 7. There was one (3.57%) student achieving a composite score of 8. No one was critically reflective during CTE 1. For CTE 1, the average composite reflective score was 4.29 ( $SD = 1.96$ ).

For CTE 2, there were five (17.86%) students who scored a 2 and were technical in nature, therefore, non-reflective. The remainder of the students scored in the reflective, but not critically reflective, category with 10 (35.71%) students scoring a 4, four (14.29%) students scoring a 5, four (14.29%) students scoring a 6, one (3.57%) student scoring a 7, and four (14.29%) students scoring an 8. Again, no one was critically reflective during CTE 2. For CTE 2, the average composite reflection score was 4.75 ( $SD = 1.90$ ).

For CTE 3, eight (28.57%) students scored a 2 and are considered non-reflective. The remaining 20 (71.43%) students were reflective, but not critically reflective. Specifically, nine (32.14%) students scored a 4, one (3.57%) student scored a 5, five (17.86%) students scored a 6, four (14.29%) scored a 7, and one (3.57%) student scored an 8. Again, no one was critically reflective. For CTE 3, the average score was 4.39 ( $SD = 1.93$ ).

Responses to Question Three could fall only into two categories: either the student was critically reflective or not. There was also a category for no response. For

CTE 1, every student ( $f = 28$ , 100%) received a score of 1, placing them in the not critically reflective category. This was true for CTE 2 and CTE 3 except that two (7.14%) students did not respond during CTE 2 and one (3.57%) student did not respond during CTE 3. Overall every student who responded ( $f = 81$ , 96.43%) scored as being not critically reflective while 3 (3.57%) did not respond. No student received a critically reflective score.

This scoring process did not seem to represent the diversity in quality of responses to the third question. Some students responded to the question, but were not reflective while other students gave responses which were much more complex. These same responses to Question Three were scored with the addition of a category for responses which were seen as “approaching critically reflective”. There were eight (28.57%) responses during CTE 1 which scored as approaching critically reflective. There were six (21.43%) responses during CTE 2 and five (17.85%) responses during CTE 3 which were seen as approaching critically reflective. Overall 19 (22.62%) of the responses were approaching critically reflective.

Students are not reflecting at high levels. Overall for Question One, more than half of the responses are technical in nature, more than one-third of the responses are descriptive with a singular focus and less than 10% are descriptive in a multifocal way. The results for the Question Two mirror those from the Question One. Overall, the largest portion of responses are technical in nature while just over one third of responses were singular descriptive in focus. Just over one-fifth of responses are multifocal descriptive. Should teacher educators expect their students to be above the technical level? Hatton and Smith (1995) contend that technical reflection is a crucial aspect for any novice

professional as it provides the foundation for the other forms of reflection. Preservice teachers are new to the profession and do not have extensive experience from which they can draw comparisons. Compare this to the findings of Hatton and Smith in an analysis of reflective thinking at the University of Sydney. They analyzed students over their four years in a secondary program for a bachelor's of education. Almost everyone was reflective on some level, with 60-70% able to be descriptive, often using those statements to set up higher levels later in their reflections. They also had 50% of their students show multiple perspectives.

In terms of occurrence, students are most reflective during the second Clinical Teaching Experience with less than half of the responses being technical. CTE 2 also has the highest number of students who are able to be multifocal in their description. Logic would indicate that the last round would have the highest levels of reflection because the students would be developing their reflective skills over time and sequence of frequency. Why would the second round feedback conference show the highest level of reflection and not the last round? Perhaps it is the nature of each of the Clinical Teaching Experiences. The first CTE is intended to develop students' skills in delivering a demonstration lesson and, by nature, is very technical. The last CTE round is the implementation and supervision of a classroom application of content activity or lab. The second CTE is the most the classic version of teaching whereby students begin with an interest approach, then *stand and deliver* the content by learning objective. This is the experience which would most clearly connect to the rest of their traditional teacher preparation courses. Perhaps it was easier for students to connect to prior knowledge, thus more conducive to generating reflection.

None of the students are able to give a dialogic or critically reflective response. Is this surprising? The literature is mixed on the length of time it takes for a person to reach the various levels of experience but many indicate that a large amount of time is involved (Calderhead & Graves, 1993). Wildman and Niles (1987) suggested that teachers need 20-30 hours of instruction followed by 20-30 hours of practice in reflection to be able to reflect on their own. Students in the experimental group had three half-hour sessions of practice while students in the placebo group had no practice in reflection.

Overall, just over one fourth of the students are technical, or non-reflective, while the remaining three-fourths of the students are reflective, but not critically reflective. Isn't this where teacher educators should expect these students to be based on the literature? What are the implications? Teacher educators must meet the students where they are. These students were at the end of their teacher preparation program and one quarter of them are still at the technical level. Teacher educators must be aware of this as they work with these students. Perhaps it is developmental. Are they not cognitively able to reflect at a higher level at this age? Is it experience? Perhaps some of the students in the room are better able to visualize themselves in their future role to reflect in a more applied way while others still see themselves as students.

When the question was set up to generate a critical response, students could not provide one. Some students were closer than others. Responses to Question Three could fall into two categories: either the student was critically reflective or not. There was an additional category for no response. For CTE 1, every student scored in the not critically reflective category. This was true for CTE 2 and CTE 3 except these rounds also included some students who did not respond at all. Overall every student who responded scored



reflective but not critically reflective. No student received a critically reflective score. Again, this is not surprising. Hatton and Smith (1995) found that college students reaching *critical reflection* was not a common occurrence.

What is surprising is that students just stopped attempting to answer this question. Why? Perhaps thinking is just too difficult or a novel experience for some students. Perhaps students decided that because their grade was not impacted by their responses to this question then they did not need to expend the effort. Perhaps it was a question of relevance. If the students did not care about the answer to the question they may not answer the question. A teacher who assesses the issue only because required is not likely to be reflective (Copeland et al., 1993). Research indicates that students need to see reflection modeled and perhaps they were not seeing critical reflection modeled. Since they did not get a grade or even feedback on their written responses, perhaps the students did not see the instrument as offering an opportunity for growth.

When the process was revised to look for nuances in the student answers, almost one quarter of the responses were approaching critically reflective. It is surprising that any of students were able to achieve this level. Again, this question was designed to illicit a critical response. Many responses began with the student expressing that they did not know how to answer the question after which students offered an answer which was approaching critical reflection. Again, perhaps it is a lack of experience to connect to their answers or perhaps it is a lack of modeling for their thought process. Or perhaps they are just not developmentally able to be fully critical in their reflections (Copeland et al., 1993). As an educator, it is important to remember that these students are in the same room as those who are still technical in their reflection.

In order to get students to reflect they must have experiences to which they can connect their reflections. Han (1995) argued that preservice teachers are not capable of reflection because of their limited classroom experience. Both Calderhead (1989) and MacKinnon (1987) argued that novice teachers cannot be expected to reflect on abstract concepts not yet experienced.

Students need to receive some form of feedback on their reflections. Feedback is critical in the process of knowledge acquisition (Mory, 2004). This feedback should not be in the form of grades. Simmons and Schuette (1988) caution that a feedback conference intended to promote reflection should not to be used as an assessment of the students. The feedback given should affirm students in their progress and suggest questions to take their reflection to a higher level, and possibly attempt to answer, or affirm the validity of, questions that are raised, and provide an overall feeling of support in their reflection. Written and/or verbal feedback is critical to making these early teaching experiences as useful as possible (Brent & Thompson, 1996). While there would be benefits to just self-reflection and/or peer feedback, the instructors' expertise is needed to maximize the benefit of the experience (Cruickshank & Metcalf, 1990; Frager, 1985).

### **Objective Three: Reflective Thinking Level by Characteristic**

CTE 1 showed a low, negative correlation ( $\tau_b = -0.28, p > .10$ ) between the students' age and their composite reflection score indicating that the younger students tend to be slightly more reflective. There was a low, negative correlation ( $\tau_c = -0.13; p > .10$ ) between cumulative GPA and composite reflection indicating that the lower the students GPA, the more reflective they tend to be. There was a low, positive correlation

( $\tau_b = 0.16; p > .10$ ) between composite reflection and program emphasis with the teaching emphasis students tending to show higher composite reflection. CTE 1 was also analyzed by sex and a moderate, positive correlation ( $\tau_b = 0.49; p < .10$ ) was found with females tending to show a higher composite reflection score.

CTE 2 was analyzed by age and found a moderate, negative correlation ( $\tau_b = -0.31; p < .10$ ) indicating that the younger students tended to score higher on composite reflection. A negligible, positive correlation ( $\tau_c = 0.07; p > .10$ ) was found between cumulative GPA and composite reflection during CTE 2 indicating that students with a higher GPA tended to be more reflective. A low, negative correlation ( $\tau_b = -0.19; p < .10$ ) was found indicating that leadership emphasis students tend to have a higher composite reflection score than teaching emphasis students. And, finally, a low, positive correlation ( $\tau_b = 0.16; p > .10$ ) was found between composite reflection and sex indicating that females tended to have a higher composite reflection score during CTE 2.

The data for CTE 3 were analyzed and there was a negligible, negative correlation ( $\tau_b = -.05; p > .10$ ) found indicating slightly more composite reflection from the younger group. Composite reflection scores were analyzed by cumulative GPA for CTE 3 and a negligible, positive correlation ( $\tau_c = 0.07; p > .10$ ) was found indicating that students with a higher cumulative GPA tended to have slightly higher composite reflection scores. Composite reflection was calculated by program emphasis and found a low, negative correlation ( $\tau_b = -0.26; p < .10$ ) indicating that leadership students tended to show a higher composite reflection score than teaching emphasis students. There was no relationship ( $\tau_b = 0.00; p > .10$ ) found between sex and composite reflection for CTE 3.

Critical reflection was gauged by response to Question Three on the instrument. Critical reflection was reported across the groups for CTE 1 with all of the students scoring not critically reflective, regardless of age, cumulative GPA, program emphasis and/or sex for CTE 1.

Critical reflection was examined for CTE 2. There was a moderate, negative correlation ( $\tau_b = -0.38; p < .10$ ) found which indicates that the younger students were more likely to give a reflective, but not-critically reflective response. There was a low, positive correlation ( $\tau_c = 0.21; p > .10$ ) found between GPA and critical reflection which indicates that the students with a high cumulative GPA were more likely to respond with a reflective but not critically reflective response. A low, negative correlation ( $\tau_b = -0.11; p > .10$ ) was found between program emphasis indicating that leadership students tended to be give a reflective but not critically reflective answer more often than the teaching emphasis students. And finally, a low, positive correlation ( $\tau_b = 0.29; p > .10$ ) was found with sex, indicating that females tended to be more critically reflective during CTE 2.

Data were analyzed for critical reflection during CTE 3. A low, negative correlation ( $\tau_b = -0.29; p < .10$ ) was found with age, which indicates that the younger students tended to give more not critically reflective responses. A low, negative correlation ( $\tau_c = -0.22; p > .10$ ) was found with GPA, indicating that the students with a lower cumulative GPA were more likely to give a reflective, but not critically reflective answer. A low, positive correlation ( $\tau_b = 0.11; p > .10$ ) was found with program emphasis indicating that teaching emphasis students are more likely to give a reflective but not critically reflective response. And finally, a low, positive correlation ( $\tau_b = 0.17; p > .10$ )

was found with sex, indicating that females were more likely to give a reflective, but not critically reflective response during CTE 3.

Females are more reflective than males. Females have higher composite reflective scores during CTE 1 and 2 as well as higher critical reflection scores for CTE 2 and 3.

There are no differences detected for composite scores during CTE 3 or critical reflection scores during CTE 1. Each time a difference is detected by sex in this study, females are the more reflective group. This supports previous research (Gilstrap & Dupree, 2008; Woods, 1993) in which females tended to be more reflective. This indicates that teacher educators might want to pay attention to sex as they facilitate reflective thought.

Anecdotally, it appears males can be reflective in the feedback conferences and, for whatever reason, do not capture this reflectivity in writing. This is suggested in Pultorak's (1993) qualitative findings which found college students were reflecting within the lower levels of Van Manen's levels of reflectivity with the bi-weekly journals and explored the higher levels of reflection with the bi-daily journals and the reflective interviews. Multiple methods may need to be used to both capture and evaluate student reflections. Teacher educators may find it necessary to use both journals, conferences, and perhaps other forms of written or verbal reflection in order to meet student preferences.

Younger students are more reflective. In all areas where differences are detected, relatively younger students have higher composite reflection scores during all three clinical teaching experiences and have higher critical reflection scores during CTE 2 and 3. No differences are detected by age during CTE 1. The fact that younger students are more reflective is counter to previous research (Whitmire, 1998; Woods, 1993). Older

students would presumably be more developmentally advanced as well as have more experience to which they might connect their reflections. The fact that younger students are more reflective is illogical. One possible explanation could be that the group of 22 and older students contained two non-traditional students, one male in his 40's and one female in her 50's who, as non-traditional students, may be altering the averages for the group. This is not to say that all non-traditional students are less reflective than traditional student; only this may have been the case in the current study. Therefore, age may be an important factor for teacher educators as they work to facilitate reflective thought, but evaluating each student independent of age may prove to be more useful.

There is no direct relationship between cumulative GPA and reflective ability among students. The relationship between students' level of reflection and their cumulative GPA appears to be mixed. For composite reflection during CTE 2 and 3, as well as critical reflection during CTE 2, students with the higher GPA are more reflective. For composite reflection during CTE 1 and critical reflection during CTE 3, students with a lower GPA tend to be more reflective. No differences are found in critical reflection scores during CTE 1, regardless of cumulative GPA. The literature would indicate that higher academic performance would indicate higher reflective ability. Perhaps students who perform well feel that they have less to reflect about. Perhaps those students with the higher GPA's are grade-driven and since no grade was tied to this assignment, they expended their energy elsewhere. It seems cumulative GPA should be held tenable when considering the reflective thinking of students in a teacher education program.

Students' level of reflection as shown by program emphasis also yields mixed results. The leadership (non-teaching) emphasis students have higher composite reflection during CTE 2 and CTE3 as well as higher critical reflection during CTE 2. No differences are found in critical reflection by program emphasis in CTE 1. Finally, teaching emphasis students have higher composite reflection scores during CTE 1 and higher critical reflection scores during CTE 3. It is potentially worth nothing that almost all students in this course were teaching emphasis with only four leadership emphasis students. Should there to be a difference by program emphasis? These are students who enroll in the same department and take many of the same courses while having similar college experiences. Perhaps it is more surprising that differences were detected at all.

#### **Objective Four: Reflective Thinking Level by Conference**

For CTE 1, the placebo group averaged a 4.43 ( $SD = 1.99$ ) and the treatment group averaged a 4.14 ( $SD = 1.99$ ). An independent samples  $t$ -test indicated this difference was not statistically significant ( $t = 0.38, p > .10$ ). A Cohen's  $d$  was calculated and showed a negligible effect size. Null hypothesis A which stated, "There will be no difference in composite reflective scores for Clinical Teaching Experience 1 between the students who have had a reflective feedback conference and those who have not" was retained.

For CTE 2, the placebo group had an average score of 5.14 ( $SD = 1.46$ ) while the treatment group had a 4.36 ( $SD = 2.24$ ). An independent samples  $t$ -test indicated that this difference was not statistically significant ( $t = 1.10, p > .10$ ). Cohen's  $d$  showed this held a small effect size. Therefore, null hypothesis B which stated, "There will be no difference

in composite reflective scores for Clinical Teaching Experience 2 between the students who have had a reflective feedback conference and those who have not” was retained.

For CTE 3, the placebo group had an average score of 4.21 ( $SD = 1.89$ ) while the treatment group had an average score of 4.57 ( $SD = 2.03$ ). An independent samples  $t$ -test indicated that this difference was not statistically significant ( $t = -0.48, p > .10$ ) and Cohen’s  $d$  showed that the effect size was negligible. Therefore, null hypothesis C which stated, “There will be no difference in composite reflective scores for Clinical Teaching Experience 3 between the students who have had a reflective feedback conference and those who have not” was retained.

For both treatment and placebo, every student scored a one during CTE 1. There was no variance, and therefore, no  $t$ -value was calculated. Null hypothesis D which stated, “There will be no difference in critical reflective scores for CTE 1 between the students who have had a reflective feedback conference and those who have not” must be retained.

For CTE 2, the placebo group had an average score of 0.93 ( $SD = 0.27$ ) as did the treatment group. This lack of variance meant that the  $t$ -value is 0. Therefore null hypothesis E which stated, “There will be no difference in critical reflective scores for CTE 2 between the students who have had a reflective feedback conference and those who have not” was retained.

For CTE 3, the placebo group had an average score of 0.93 ( $SD = 0.27$ ) while the treatment group had an average score of 1.00 ( $SD = 0.00$ ). An independent samples  $t$ -test was calculated and found a statistically significant difference ( $t = -1.00, p < .10$ ). A Cohen’s  $d$  was calculated and shows a small effect size. Therefore, the null was rejected



in favor of the alternative which stated, “There will be a difference in critical reflective scores for CTE 3 between students who have had a reflective feedback conference and those who have not.”

The treatment made no difference in students’ composite reflection score. Even with a more lenient alpha level, independent samples *t*-tests find no significant difference in composite reflection scores between the two groups for any of the three clinical teaching experiences indicating that the placebo and treatment groups are similar in their reflective ability. Perhaps there are truly no differences or perhaps the instrument is not sensitive enough to see the differences.

There is a difference in critical thinking levels for students who receive the treatment during CTE 3. There is no variance for critical reflection during the first or second clinical teaching experiences, but a significant difference is found between the groups on critical reflection scores during CTE 3 with the treatment group being more reflective. A Cohen’s *d* shows a small effect size. Perhaps the experiment was not long enough to detect differences as they just started to show in the third round. Will this small amount of success continue across student teaching if reflection is not regularly supported by the cooperating teacher?

For 5 of the 6 areas examined for differences, no difference was detected. Korthagen (1988) argued that some students are ready to learn in a reflective program while others are not. Perhaps the differences are less about the treatment and more about student differences in their ability to reflect. It is expected that, based on the literature, students who are receiving cognitive coaching from their reflective feedback conferences should be more able to reflect at higher levels after each round. The idea that they are

able to reflect verbally on the question during the instructor-led feedback conference should allow them to reflect on paper at a higher level than those students who did not have that experience. Bates et al. (2009) had a study where some students had supervisory interviews and others did not but that study found no difference found between the group with the intensive involvement of a reflective supervisor and the group which journaled on their own. Bates et al. proposed that this may have occurred because students in both groups of the study reported talking to others about their teaching and therefore, no one was truly reflecting in isolation. Perhaps this occurred in the present study as well. While the results of this study suggest that feedback conferences fail to contribute toward developing reflecting thought the researcher reserves judgment.

### **Recommendations for Further Research**

Results have shown that, on average, younger students and females are more reflective while cumulative GPA and program emphasis do not seem to make an impact. There is also data which shows some differences appearing among the treatment groups towards the end of the study. However, more questions remain. A longer experiment should be conducted to see if the differences are too subtle to be picked up across a semester. Perhaps follow a group not just through their methods course but also throughout student teaching to see if having the *real world* experience to connect to changes their reflective ability.

A group should be followed from the time they enter a teacher education program. The ability to reflect does not happen during one course or even over a few courses (Ross, 1990). Perhaps they are all technical in their reflection as freshmen and the

fact that only one quarter of the students are still at that level three and a half years later may represent tremendous progress. Perhaps the opposite is true and the students have not advanced in their four years in college. A larger population should be studied to increase the power and types of statistics that can be used to look for what may be subtle differences.

If reflection is a worthy goal, it should be integrated throughout the teacher education program, from introduction courses and through curriculum, teacher education and methods courses. If time is the key factor, opportunities should be sought to maximize time spent reflecting during the teacher education program. These opportunities to reflect could also be extended to include the time new teachers spend completing induction programs.

Perhaps students are reflecting in ways that are not being captured in a paper/pencil journal-like format. Replication of this study should be done while collecting student reflection in a format other than writing (i.e. voice). Since the conferences in this study were recorded, a future study could include comparing written to oral feedback.

## APPENDIX A: 4330 SYLLABUS

Agricultural Education 4330/7330  
**Teaching Agriculture Subjects**  
Fall Semester 2009



College of  
Agriculture  
Food and  
Natural  
Resources

### **Instructor**

Robert M. Torres, Professor  
Department of Agricultural Education, 126 Gentry Hall  
Office: 884-7376 • Home: 817-0721 • Admin. Assist (Carol Swaim): 882-7451  
E-mail: [TorresR@missouri.edu](mailto:TorresR@missouri.edu) Office Hours: Open Door Policy

### **Laboratory Instructors**

Misty Lambert  
Graduate Teaching Assistant  
125A Gentry Hall  
Office Phone: 882-2200  
Email: [mdl7c9@mail.missouri.edu](mailto:mdl7c9@mail.missouri.edu)

Lucas Maxwell  
Graduate Teaching Assistant  
125 Gentry Hall  
Office Phone: 882-2200  
Email: [ldmrkb@mail.missouri.edu](mailto:ldmrkb@mail.missouri.edu)

### **Times and Location:**






Monday <u>and</u> Wednesday 10:00 - 10:50 a.m.	113 Gentry
• Lab 1A: Tuesday 2:00 - 4:30 p.m.	113 Gentry
• Lab 1B: Thursday 2:00 - 4:30 p.m.	113 Gentry





**Course Description:** Instructional methodology course focused on teaching approaches and methods, problem-solving teaching techniques, and managing learning environments for teaching agriculture subjects in formal and nonformal educational settings.

**Prerequisite:** Ag Ed 4320



**Instruction Format:** Lecture/Discussion/Small Group/Clinical Experiences

**Course Outcomes:** Through clinical teaching experiences, projects, in-class assignments and activities, quizzes, and feedback conferences students will demonstrate the following:

-  Evaluate teaching based on the 10 principles of teaching and learning, and the five Rosenshine and Furst Teaching Behaviors.
-  Exhibit Hedges' three essential teacher competencies.
-  Implement well-planned instructional activities that result in positive and productive learning environments.
-  Assemble instruction, learning materials, and learning activities to effectively teach agriculture subjects.
-  Demonstrate mastery using the Four Step Approach to Teaching and a variety of instructional methods appropriate for teaching agriculture subjects in formal and nonformal learning environments.

-  Demonstrate the ability to incorporate problem-solving techniques into the instructional process.
-  Utilize a variety of visuals appropriate for displaying instructional content.
-  Incorporate interactive teaching techniques that promote learner participation.
-  Demonstrate the ability to be reflective about the teaching and learning process.








### Required Course Materials:

-  Ag Ed 4330/7330 Course Materials Packet [available at the MU Bookstore]
-  Ag Ed 4320/7320 Course notes, handouts, and “3x5” Principles of Teaching card

### Recommended Textbooks: [available through MU Bookstore & online]

-  West, E, (1997) *201 Icebreakers*, McGraw Hill
-  Kagan, S (2008) *Cooperative Learning*, Kagan

### Web-based Resources:

-  BlackBoard.missouri.edu
-  Instructional Planning and Problem-Solving Templates (for use with Microsoft Word)  
<http://www.aged.missouri.edu/AgEd/resource.htm>
-  Instructional Materials Laboratory (complementary access for 1 year)  
<http://www.iml.missouri.edu/>
-  Center for Agricultural and Environmental Research & Training Curriculum (complementary access for 1 year) <http://www.caert.net/>  
-Assess is your e-mail address as user name and “missouri”, as password
-  Effective Teaching in Agriculture and Life Sciences  
<http://www.ais.msstate.edu/TALS/index.html>
-  Garton, B. L. (Ed.). (1997). *Agricultural education program planning handbook for Missouri schools* (4th ed.). Jefferson City, MO: Joint State Staff in Agricultural Education, Agricultural Education Section, Missouri Department of Elementary and Secondary Education. [Available in PDF format at:  
<http://www.ssu.missouri.edu/aged/pphandbk/handbk.pdf>]
-  This site is devoted to Scouting advancement. You'll find lots of information and resource links for scouting advancement requirements. Even though the focus is on the **Boy Scouts of America**, many merit badge subjects are similar to the skill awards offered by other youth organizations. MeritBadge.com can be helpful to boys and girls from many different youth programs. Specific curriculum can be found at <http://www.meritbadge.com/worksheets/>

## PROFESSIONALISM STATEMENT

Educators are professionals guided by specific values and engaging in particular behaviors. These values and behaviors include respect, cooperation, active participation, intellectual inquiry, punctuality, and regular attendance. In addition to what you know and can do, you will be evaluated on your growth as a professional. Professional characteristics on which you will be judged include punctuality, attendance, collegial attitude, and participation. Because this course relies extensively on discussion and other class interactions, attendance is crucial to your success and that of your classmates. If you are ill or an emergency occurs, contact the instructor prior to the scheduled class time; otherwise, your attendance and participation are firm expectations.

Toward this effort, the following **professional expectations** exist:

- ☒ Come to class every day. Unexcused absences will lower your grade. Pre-arranged absences will only be excused if the instructor deems the reason to be valid. Absences due to illness or injury will be excused by a doctor's note.
- ☒ Arrive to class on time. As prospective professionals you are expected to be punctual.
- ☒ Participate in the class by contributing to discussion and other interactive activities.
- ☒ Refrain from using any form of tobacco in the classroom.
- ☒ Remove your hat upon entering the classroom.
- ☒ Professional dress is required for presenters **during Lab** (unless indicated differently). For males, this is interpreted to mean a tie, button-up dress shirt, and dress trousers (no *faded* denim/jeans). For females, this is interpreted to mean a blouse and skirt or dress trousers (no *faded* denim/jeans), or a dress.
- ☒ Positive leadership and interpersonal relationships are encouraged. Disrespect toward your instructors, fellow students, or resource people won't be tolerated.
- ☒ At times, the instructors must evaluate professionalism subjectively.

## UNIVERSITY POLICY STATEMENTS

**ACCESSIBILITY STATEMENT**• If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class, or at my office.

To request academic accommodations (for example, a note taker), students must also register with the Office of Disability Services, S5 Memorial Union, 882-4696. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage

**ACADEMIC DISHONESTY STATEMENT**• Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor.

The faculty and administration recognize the necessity of maintaining an academic environment in which each student is evaluated on the basis of his/her own performance. The maintenance of such an environment requires that both faculty and students be aware of the nature and consequences of academic dishonesty. Academic dishonesty includes but is not necessarily limited to the following:

1. Cheating or knowingly assisting another student in committing an act of cheating or other academic dishonesty.
2. Plagiarism, which includes but is not necessarily limited to, submitting examinations, theses, reports, drawings, laboratory notes or other material as one's own work when such work has been prepared by another person or copied from another person.
3. Unauthorized possession of examinations or reserve library materials, destruction or hiding of source materials, library materials, or laboratory materials or experiments or any other similar actions.
4. Unauthorized changing of grades or marking on an examination or in an instructor's grade book, or such change of any grade record.

M Book, (undated) <http://web.missouri.edu/~mbookwww>

**NONDISCRIMINATION STATEMENT**• Faculty and staff in the College of Agriculture, Food and Natural Resources are committed to cultural diversity and nondiscrimination toward all people with regards to race, color, religion, national origin, ancestry, gender, age, all veterans, and sexual orientation.

Note: Ag Ed 4330/7330 projects may not be submitted to another instructor (or vice versa) unless the student obtains prior approval from instructors of both courses.

## CLASS SCHEDULE & TENTATIVE TEACHING CALENDAR

Wk	Date	Lesson / Content / Learning Experience	
		Teacher Certification	Leadership
1	Aug 24	Course overview • objectives, expectations, assignments, etc.	
	Aug 26	Review principles of teaching & learning and effective teaching characteristics	
2	Aug 31	Recognizing Hedge's Essential Teacher Competencies; Models of Educational Delivery	
	Sept 2	Recognizing the BSA ( <b>Dr. Terry</b> )	BSA Teaching Team Assignments
3	Sept 7	No Class ( <b>Labor Day Holiday</b> )	
	Sept 9	The Instructional Process / Planning for instruction using the Four-Step Approach	
4	Sept 14	Selecting and using a variety of teaching methods	
	Sept 16	Selecting and developing teaching visuals ( <b>Ms. Lambert</b> )	
5	Sept 21	Effectively using the lecture-explaining method of teaching ( <b>Mr. Maxwell</b> )	
	Sept 23	Setting up experiential (applied) learning activities: <i>"Connect it; Direct it; Check it; Monitor it; Evaluate it"</i>	
6	Sept 28	No Class – NCAAAE Agricultural Education Conference	
	Sept 30	<b>Qu-est #1:</b> Leading Group Discussions: Socratic Dialogue	
7	Oct 5	Leading Group Discussion: Brainstorming & Buzz Groups	
	Oct 7	Teaching with the Problem-Solving (Decision-Making) Techniques	
8	Oct 12	Using problem-solving techniques	
	Oct 14	Using problem-solving techniques (Mid-term Feedback)	
9	Oct 19	Using problem-solving techniques	
	Oct 21	<i>(Collegiate Ag Ed/ATA Conference and National FFA Convention)</i>	
10	Oct 26	Maximizing the Use of Flip Chart ( <b>Ms. Lambert</b> )	
	Oct 28	<b>Qu-est #2</b>	
11	Nov 2	Using directed (supervised study) to seek out information and data	
	Nov 4	Presentations on role play, case study, field trip/educational tour, resource people	
12	Nov 9	Dr. Larry Case: Executive in Residence	
	Nov 11	Teaching Adult & Non-formal Audiences ( <b>Mr. Maxwell</b> )	
13	Nov 16	Teaching to develop higher-order thinking skills ( <b>Ms. Lambert</b> )	
	Nov 18	Using ice breakers in the instructional process ( <b>Mr. Maxwell</b> )	
<b>Nov 23 – 27 Thanksgiving Recess • Fall Break</b>			
14	Nov 30	Managing learner behaviors and expectations	
	Dec 2	Managing learner behaviors expectations	
15	Dec 7	CAFNR Merit Badge Debriefing	
	Dec 9	Teaching Agriculture Subjects (Jeopardy) – <b>Capstone Project Due</b>	
16	Dec 17	<b>Final Examination Week Exam #3 (Comprehensive) - 1:00-3:00 p.m.</b>	

*The schedule and procedures are subject to change in the event of extenuating circumstances*



Course Assignments		% of Final Grade
Clinical Teaching Experiences (three experiences):	Instructional plan (20%), Teaching performance (75%), and self-reflection (5%)	55
Capstone Assignment & Experience..... <b>December 5</b> CAFNR Merit Badge Center – Finalized notebooks due Friday, December 11		25
Quiz/Test/Final Exam (5% each)		15
Professionalism (prompt attendance, participation, and in-class assignments/activities)		05
<b>TOTAL</b>		<b>100</b>

Note. Assignment score will be reduced 5 % for each day submitted past the due date.

### GRADING SCALE

A+ = 99.0 - 100.0 %	B+ = 87.0 - 89.9 %	C+ = 77.0 - 79.9 %	D+ = 67.0 - 69.9 %
A = 94.0 - 98.9 %	B = 84.0 - 86.9 %	C = 74.0 - 76.9 %	D = 64.0 - 66.9 %
A- = 90.0 - 93.9 %	B- = 80.0 - 83.9 %	C- = 70.0 - 73.9 %	F = below 64.0 %

### DESCRIPTION OF COURSE ASSIGNMENTS

**Clinical Teaching Experiences** • Designed to provide the application of knowledge and skills needed to teach agriculture subjects in formal and non-formal educational settings. The experiences also provide students with the opportunity to reflect on what it takes to effectively teach through instructor and self evaluations. Students will teach four times during the semester. Instructor feedback will be provided during a student-instructor conference after each teaching experience. **Attendance is mandatory for ALL lab sessions.** For each lab session missed, (no matter what reason), the student must attend the “other” lab section.

**Capstone Assignment & Experience** • CAFNR Merit Badge Center - Putting it all together.

This assignment is a ‘team’ effort. From the selections available, each team will select an agriculture-related merit topic to teach. Teaching teams should develop an approach similar to a workshop. That is, develop a workshop schedule of topics [BIG PICTURE] with build in reference to breaks, lunch, starting and concluding times. Then, proceed by planning the individual lessons [LITTLE PICTURE] that address each topic (assign teaching responsibility). Each lesson will have the 4-steps (Preparation, Presentation, Application, & Evaluation). Plan for a formal end-of-the-workshop evaluation. Students should plan to integrate a variety of instructional methods (learned in class) and instructional aides (e.g., ice breakers, flip charts, handouts, etc.). All workshop materials should be placed into a notebook and organized by workshop session.

**Quiz/Tests** • are announced and consist of multiple-choice, true-false, short answer questions and problem-solving/application activities. **Final Exam** • is a comprehensive type exam.

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LAB 1A - Tuesday

**Laboratory Instructors**

Misty Lambert  
Graduate Teaching Assistant  
125A Gentry Hall

Lucas Maxwell  
Graduate Teaching Assistant  
125 Gentry Hall

**Time and Location:** Tuesday 2:00 - 4:30 p.m., 113 Gentry

**Clinical Teaching Experiences** • are designed for the application of knowledge and skills necessary to teach agriculture subjects in formal and non-formal educational settings. The experiences also provide students with the opportunity to reflect on what is required to effectively teach through instructor and self evaluations. Students will have the opportunity to complete four clinical teaching experiences during the semester. Instructor feedback will be provided during a student-instructor conference after each teaching experience.

Clinical Teaching Experience I: Create interest (anticipatory set) in learning a skill and teach the skill using the **demonstration method** of teaching. Grading criteria from Ag Ed 4320 will be used to assess demonstration plans. (*25 minutes*).

Clinical Teaching Experience II: Create interest (anticipatory set), communicate the objectives, and teach a lesson as complete as possible using the **Four Step Approach**. You are not expected to complete the lesson (*25 minutes*).

Clinical Teaching Experience III: Conduct an **experiential learning activity** (Application Step) that would be integrated into a secondary agriculture lesson. “*Connect it; Direct it, Check it, Monitor it, & Evaluate it*” (*25 minutes*).

Capstone Assignment & Experience: (Mizzou Merit Badge Center) Using a team-teaching approach (3 persons), teach a **complete unit of instruction** to local Boy Scouts (n~10-14) on a topic related to agriculture/science, environmental science, natural resources, etc. Individual lessons will be delivered using a workshop setting. Consult the instructor for appropriate topics. The lessons must contain the appropriate elements consistent with the Four- Step approach. Students will be **expected** to devote **Saturday, December 5** (approx. 6 hrs) for this teaching assignment. Further details will be provided later.

*Students are encouraged to incorporate a variety of teaching methods, techniques, and visual aids into their teaching experiences.*

### **Guidelines and Expectations for Lab Teaching Experiences**

One week (seven days) prior to a student's scheduled teaching experience he/she must submit a typed copy of his/her COMPLETE instructional plan (*with anticipated handout(s), transparency masters and/or PowerPoint slide, etc.*). The laboratory instructor will evaluate the instructional plan and provide feedback for improvement. If necessary, the instructor will request a conference with the student. Failure to submit an instructional plan seven (7) days prior to the scheduled teaching experience will result in a grade reduction of five (5) percent for each day the instructional plan is late. For example, if a student submits his/her instructional plan two days late his/her grade would be reduced by 10%.

**Redos** - If a student has the desire to improve his/her initial instructional plan score he/she may request that the plan be re-evaluated at the conclusion of the teaching experience. To be re-evaluated the original instructional plan, original grading criteria form, and revised instructional plan are required and must be submitted on the day of the teaching experience. The instructional plan portion of the final grade will be calculated by averaging the two grades.

***Prior to the start of each laboratory, students will present the instructor with a copy of their instructional plan and instructional materials (e.g., PowerPoint slides, Transparency masters, handouts, etc.). Failure to present an instructional plan will prevent the student from teaching and consequently receive a zero (0) for the teaching experience.***

**360° - Evaluation of Teaching** • The basis for evaluating a student's teaching performance will be: the extent that the laboratory teaching objective (assignment) was met; the extent to which the principles of teaching and learning were utilized; and the student's ability to demonstrate Rosenshine and Furst effective teacher behaviors and Hedges' effective teacher competencies.

**Feedback Conferences** • Students are required to meet with the lab instructor for a feedback conference after each teaching experience. During the feedback conference, the student's teaching experience will be discussed and the strengths and weaknesses of the student's teaching performance will be examined. Students are to view the videotape of their teaching *prior* to the conference and make a written self-critique of their teaching. Failure to attend the conference will result in a zero (0) for the teaching experience.

***(\*\*Items to bring: 3X5 Card and written self-critique)***

**Note Taking Assignment:** • One person will be asked to be the "note taker" representing the learners. The intent of this role is to "mirror" what the teacher has attempted to present. The note taker will submit the notes to the lab instructor who will then share it with the teacher-presenter during the feedback conference.

**Camera Assignments** • During teaching presentations, one individual will be responsible to operate the video camera (each lab will have a different student assigned – See Lab Schedule). The responsibilities include securing the DVD from the lab instructor, labeling DVDs with the presenters' name, and recording the clinical teaching experience on the presenter's DVD, and then provide the presenter with the DVD.

LAB 1A - Tuesday

**LABORATORY SCHEDULE**

<b>Week</b>	<b>Date</b>	<b>Clinical Teaching Experiences</b>
1	Aug 25	Teaching with Technology Planning and Teaching with Demonstrations (a review)
2	Sept 1	Clinical Teaching Experience I • <b>Demonstration (A)</b>
3	Sept 8	Clinical Teaching Experience I • <b>Demonstration (B)</b>
4	Sept 15	Clinical Teaching Experience I • <b>Demonstration (C)</b>
5	Sept 22	Clinical Teaching Experience II • <b>Four-Step Approach (A)</b>
6	Sept 29	<b>No Lab</b> – ( <i>Faculty/Graduate Student NCAAAE Conference</i> )
7	Oct 6	Clinical Teaching Experience II • <b>Four-Step Approach (B)</b>
8	Oct 13	Clinical Teaching Experience II • <b>Four-Step Approach (C)</b>
9	Oct 20	<b>No Lab</b> ( <i>Collegiate Ag Ed/ATA Conference &amp; National FFA Convention</i> )
10	Oct 27	Clinical Teaching Experience III • <b>Experiential Learning Activity (A)</b>
11	Nov 3	Clinical Teaching Experience III • <b>Experiential Learning Activity (B)</b>
12	Nov 10	Clinical Teaching Experience III • <b>Experiential Learning Activity (C)</b>
13	Nov 17	<b>Mizzou Merit Badge Center (Planning session)</b>
Nov 23• 27		<b>Thanksgiving Recess • Fall Break</b>
15	Dec 1	<b>Mizzou Merit Badge Center (Planning session)</b>
♣	Dec 5	<b>Mizzou Merit Badge Center: CAFNR - Locations TBA</b>
16	Dec 8	Transitioning into Student Teaching: Final details: Review of assignments

Agricultural Education 4330/7330  
**Teaching Agriculture Subjects**

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Teaching Laboratory Schedule - Tuesday • Fall Semester 2009

**Clinical Experience I (*Demonstrations*)**

Group A (Sept 1)

Group B (Sept 8)

Group C (Sept 15)

*Names removed*

*Names removed*

*Names removed*

*Note taking task: Randomly assigned (1)*

*Camera Assignment:*

**Clinical Experience II (*Four-Step Approach*)**

Group A (Sept 22)

Group B (Oct 6)

Group C (Oct 13)

*Names removed*

*Names removed*

*Names removed*

*Note taking task: Randomly assigned (1)*

*Camera Assignment:*

**Clinical Experience III (*Experiential/Application Activity*)**

*“Connect it; Direct it; Check it; Monitor it; Evaluate it”*

Group A (Oct 27)

Group B (Nov 3)

Group C (Nov 10)

*Names removed*

*Names removed*

*Names removed*

*Camera Assignment:*

**Capstone Experience (*CAFNR Mizzou Merit Badge Center*)**

**Saturday, Dec 5**

Team assignments to be made later.

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LAB 1B - Thursday

**Laboratory Instructors**

Misty Lambert  
Graduate Teaching Assistant  
125A Gentry Hall

Lucas Maxwell  
Graduate Teaching Assistant  
125 Gentry Hall

**Time and Location:** Thursday 2:00 - 4:30 p.m., 113 Gentry

**Clinical Teaching Experiences** • are designed for the application of knowledge and skills necessary to teach agriculture subjects in formal and non-formal educational settings. The experiences also provide students with the opportunity to reflect on what is required to effectively teach through instructor and self evaluations. Students will have the opportunity to complete four teaching experiences during the semester. Instructor feedback will be provided during a student-instructor conference after each teaching experience.

Clinical Teaching Experience I: Using the **demonstration** method of teaching, create interest in learning and teach the knowledge and skills necessary for participants to successfully perform a selected skill. NO FOOD Demonstrations *please*. Grading criteria from Ag Ed 4320 will be used to assess demonstration plans (**25 minutes**).

Clinical Teaching Experience II: Create interest (anticipatory set), communicate the objectives, and teach a lesson as complete as possible using the **Four Step Approach**. You are not expected to complete the lesson (**25 minutes**).

Clinical Teaching Experience III: Conduct an **experiential learning activity** (Application Step) that would be integrated into a workshop/seminar. “*Connect it; Direct it, Check it, Monitor it, & Evaluate it*” (**25 minutes**).

Capstone Assignment & Experience: (Mizzou Merit Badge Center) Using a team-teaching approach (3 persons), teach a **complete unit of instruction** to local Boy Scouts (n~10-14) on a topic related to agriculture/science, environmental science, natural resources, etc. Individual lessons will be delivered using a workshop setting. Consult the instructor for appropriate topics. The lessons must contain the appropriate elements consistent with the Four- Step approach. Students will be **expected** to devote **Saturday, December 5** (approx. 6 hrs) for this teaching assignment. Further details will be provided later.

*Students are encouraged to incorporate a variety of teaching methods, techniques, and visual aids into their teaching experiences.*

### **Guidelines and Expectations for Lab Teaching Experiences**

One week (seven days) prior to a student's scheduled teaching experience he/she must submit a typed copy of his/her COMPLETE instructional plan (*with anticipated handout(s), transparency masters and/or PowerPoint slide, etc.*). The laboratory instructor will evaluate the instructional plan and provide feedback for improvement. If necessary, the instructor will request a conference with the student. Failure to submit an instructional plan seven (7) days prior to the scheduled teaching experience will result in a grade reduction of five (5) percent for each day the instructional plan is late. For example, if a student submits his/her instructional plan two days late his/her grade would be reduced by 10%.

**Redos** - If a student has the desire to improve his/her initial instructional plan score he/she may request that the plan be re-evaluated at the conclusion of the teaching experience. To be re-evaluated the original instructional plan, original grading criteria form, and revised instructional plan are required and must be submitted on the day of the teaching experience. The instructional plan portion of the final grade will be calculated by averaging the two grades.

***Prior to the start of each laboratory, students will present the instructor with a copy of their instructional plan and instructional materials (e.g., PowerPoint slides, Transparency masters, handouts, etc.). Failure to present an instructional plan will prevent the student from teaching and consequently receive a zero (0) for the teaching experience.***

**360° - Evaluation of Teaching** • The basis for evaluating a student's teaching performance will be: the extent that the laboratory teaching objective (assignment) was met; the extent to which the principles of teaching and learning were utilized; and the student's ability to demonstrate Rosenshine and Furst effective teacher behaviors and Hedges' effective teacher competencies.

**Feedback Conferences** • Students are required to meet with the lab instructor for a feedback conference after each teaching experience. During the feedback conference, the student's teaching experience will be discussed and the strengths and weaknesses of the student's teaching performance will be examined. Students are to view the videotape of their teaching **prior** to the conference and make a written self-critique of their teaching. Failure to attend the conference will result in a zero (0) for the teaching experience.

**(\*\*Items to bring: 3X5 Card and written self-critique)**

**Note Taking Assignment:** • One person will be asked to be the "note taker" representing the learners. The intent of this role is to "mirror" what the teacher has attempted to present. The note taker will submit the notes to the lab instructor who will then share it with the teacher-presenter during the feedback conference.

**Camera Assignments** • During teaching presentations, one individual will be responsible to operate the video camera (each lab will have a different student assigned – See Lab Schedule). The responsibilities include securing the DVD from the lab instructor, labeling DVDs with the presenters' name, and recording the clinical teaching experience on the presenter's DVD, and then provide the presenter with the DVD.

LAB 1B - Thursday  
**LABORATORY SCHEDULE**

Week	Date	Clinical Teaching Experiences
1	Aug 27	Teaching with Technology Planning and teaching with demonstrations (review)
2	Sept 3	Clinical Teaching Experience I • <b>Demonstration</b>
3	Sept 10	Clinical Teaching Experience I • <b>Demonstration</b>
4	Sept 17	Clinical Teaching Experience I • <b>Demonstration</b>
5	Sept 24	Clinical Teaching Experience II • <b>4 Step Approach</b>
6	Oct 1	No Lab (Faculty/Graduate Student <i>NCAAAE Conference</i> )
7	Oct 8	Clinical Teaching Experience II • <b>4 Step Approach</b>
8	Oct 15	Clinical Teaching Experience II • <b>4 Step Approach</b>
9	Oct 22	No Lab ( <i>Collegiate Ag Ed/ATA Conference and National FFA Convention</i> )
10	Oct 29	Clinical Teaching Experience III • <b>Experiential Learning Activity</b>
11	Nov 5	Clinical Teaching Experience III • <b>Experiential Learning Activity</b>
12	Nov 12	Clinical Teaching Experience III • <b>Experiential Learning Activity</b>
13	Nov 19	Clinical Teaching Experience IV • <b>Mizzou Merit Badge Center (PIng)</b>
<b>Nov 23 • 27</b>		<b>Thanksgiving Recess • Fall Break</b>
14	Dec 3	Clinical Teaching Experience IV • <b>Mizzou Merit Badge Center (PIng)</b>
♣	<b>Dec 5</b>	<b>Mizzou Merit Badge Center: Location TBA</b>
15	Dec 10	Clinical Teaching Experience IV • <b>Mizzou Merit Badge Center (no lab)</b> <b>Teacher Certification students attend Tuesday's lab (12/8)</b>



Agricultural Education 4330/7330

**Teaching Agriculture Subjects**

Teaching Laboratory Schedule – Thursday • Fall Semester 2009

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**Clinical Teaching Experience I (*Demonstration*)**

Group A (Sept 3)

Group B (Sept 10)

Group C (Sept 17)

*Names removed*

*Names removed*

*Names removed*

*Note taking task: Randomly assigned (1)*

*Camera Assignment:*

**Clinical Teaching Experience II (*4 Step Approach*)**

Group A (Sept 24)

Group B (Oct 8)

Group C (Oct 15)

*Names removed*

*Names removed*

*Names removed*

*Note taking task: Randomly assigned (1)*

*Camera Assignment*

**Clinical Teaching Experience III (*Experiential Learning Activity*)**

*“Connect it; Direct it; Check it; Monitor it; Evaluate it”*

Group A (Oct 29)

Group B (Nov 5)

Group C (Nov 12)

*Names removed*

*Names removed*

*Names removed*

*Camera Assignment:*

**Capstone Experience (*CAFNR Mizzou Merit Badge Center*)**

**Saturday, Dec 5**

Team assignments to be made later.

## APPENDIX B: PANEL OF EXPERTS

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Panel Member	Area of Expertise
Dr. Anna L. Ball	Teacher Education
Dr. Deborah L. Carr	Teacher Education
Dr. Bryan L. Garton	Teacher Education
Dr. Robert Terry, Jr.	Teacher Education
Dr. Robert M. Torres	Teacher Education

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## **APPENDIX C: REFLECTIVE CONFERENCE PROTOCOLS**

(Questions assembled and/or modified from Cognitive Coaching (Costa & Garmston, 2002) & handout from

<http://www.education.pitt.edu/mispy/articles/CognitiveCoaching.pdf>)

### **Instructors SHOULD:**

Stay within the 30 minute time frame, even if all questions are not asked.

Hold all conferences in Gentry Hall.

Collect the + and – sheet from students.

Return peer feedback.

Return your feedback.

Maximize the time the student is talking.

Audio record the conference.

Have the lesson plan at the conference.

Give out a copy of the questions at the end.

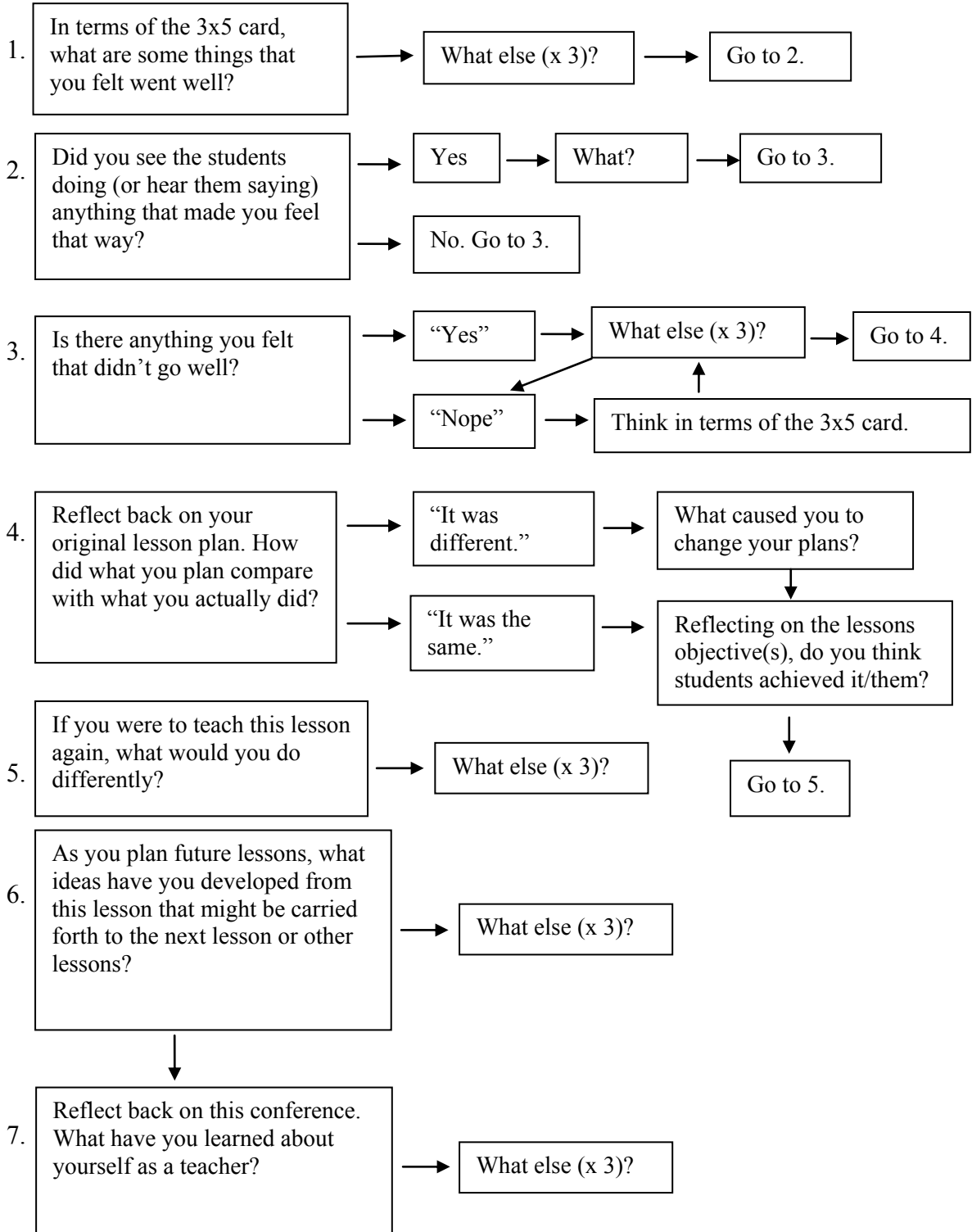
Hold all conferences within three days of the student's lesson.

### **Instructors SHOULD NOT:**

Assign a grade until the questions are returned.

Reflective Instructor-led Feedback Conference Protocol (Flow Chart)

**BEGIN RECORDING:** “I want to ask you to reflect back on the lesson that you taught.”



## **APPENDIX D: PLACEBO CONFERENCE PROTOCOLS**

### Instructors SHOULD:

Stop at 30 minutes.

Hold all conferences in Gentry.

Collect the + and – sheet.

Return peer feedback.

Return instructor feedback.

Give out a copy of the questions at the end.

Hold all conferences within three days of presentations

Have the lesson plan at the conference.

Audio record the conference.

Make a conscious effort to stay at lower levels of cognition.

Acknowledge any “reflective” comments by students but refrain from probing.

### Instructors SHOULD NOT:

Talk about the instructional delivery.

Go over instructor feedback.

Go over peer feedback.

Go over the + and – sheet.

Assign a grade until the questions are returned.

Concern themselves with maximizing student response time.

Questions can include the following:

### **About Demonstration Lesson Plan**

What does a title need? (*-ing action verb*)

What are the 3 parts of an objective? (*performance, condition, criteria*)

Why is it important to list your supplies and equipment?

What is the purpose of an interest approach?

What is the difference between 'Key information' and 'Steps'?

What kind of things should be in the key information section of the plan? (*safety concerns, theory, why the step is important, special techniques*)

All students do not need to participate in the application. What are the other options?

### **About Yellow Card**

Which 'Characteristic of Effective Teaching' do you think is the most important?

Which "Principle of Teaching and Learning" do you think is the most important?

Which "Principle of Teaching and Learning" is achieved by the interest approach?

Which "Principle of Teaching and Learning" is achieved by the objective?

Which "Principle of Teaching and Learning" is achieved by the application portion?

### **Others**

What is your understanding of the next assignment?

Do you have any concerns about the next assignment?

What is your understanding of the capstone experience?

Do you have any concerns about the capstone experience?

## APPENDIX E: POST-FEEDBACK REFLECTIVE QUESTIONS

Agricultural Education 4330/7330  
**Teaching Agriculture Subjects**  
Fall Semester 2009

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College of  
Agriculture  
Food and  
Natural  
Resources

### Reflection

Student Name: \_\_\_\_\_ CTE #1:  CTE #2:  CTE #3:

*Directions: Please **HANDWRITE** your answers to the following questions **IN COMPLETE SENTENCES**. Return this to **YOUR** instructor the next time you see each other.*

1.) Do you think your lesson was successful? Why or why not?

2.) What alternative teaching methods could you have used on this lesson and how might these have improved the learning process for students, collectively or individually?



3.) What moral and/or ethical concerns occurred / could occur as a result of the lesson.  
Justify your answer.

Occurred:

Could have occurred:

## APPENDIX F: RUBRIC FOR SCORING REFLECTION INSTRUMENTS

Question 1: Was this lesson successful? Why or why not?

Level	Term
0	No response
1	Technical
3	Descriptive (singular focus)
4	Descriptive (multifaceted)
5	Dialogic (singular focus)
6	Dialogic (multifaceted)
7	Critically reflective

Question 2: What alternative teaching methods could you have used on this lesson and how might these have improved the learning process for students, collectively or individually?

Level	Term
0	No response
1	Technical
3	Descriptive (singular focus)
4	Descriptive (multifaceted)
5	Dialogic (singular focus)
6	Dialogic (multifaceted)
7	Critically reflective

Question 1 score + Question 2 score =

- 0 = Missing data
- 1 or 2 = Non-reflective
- 3 – 12 = Reflective
- 13-14 = Critically reflective

Question 3: What moral and/or ethical concerns occurred / could occur as a result of the lesson. Justify your answer.

Level	Term
0	No response
1	Not-critically reflective
2	Critically reflective

## APPENDIX G: SELECTION OF QUESTIONS

August 17, 2009

Dear Committee:

I am working to narrow down the questions we use during the reflective conference. According to Costa and Garmston (2002), there are six levels to the coaching process. I have assembled questions under each level, but they need to be validated as representing that level of coaching. Additionally, following the committee's advice from last week, the list needs to be paired down.

Therefore, I need you to place a check mark beside the **three-four** questions under each area which you feel best capture the level of reflection. (If there are questions not on this list that you think would be better, please write in the suggestion.) Please return these to me by

**Thursday, August 20.** I look forward to your responses.

Thanks!!

Misty Lambert

**1) Summarize their impressions and assessments of the lesson.** *(Ideally, these should be initial questions designed to elicit general impressions and/or lists.)*

- \_\_\_\_\_ As you reflect back on the lesson, how do you feel it went?
- \_\_\_\_\_ What were some of the things that you felt went well?
- \_\_\_\_\_ What do you think you did well in this lesson?
- \_\_\_\_\_ What did you feel went well with your lesson?
- \_\_\_\_\_ Is there anything you think didn't go well?
- \_\_\_\_\_ Is there anything that didn't go as well as you had planned?
- \_\_\_\_\_ What did you find most difficult about teaching this lesson?
- \_\_\_\_\_ What was least effective in your lesson today?
- \_\_\_\_\_ What were you thinking when you decided to do that?
- \_\_\_\_\_ What made you decide to use this topic for this lesson?
- \_\_\_\_\_ What did you do to get your students interested/involved in the topic?
- \_\_\_\_\_ What did you do to encourage active participation?

**2) Recall data supporting those impressions and assessments.** *(Ideally, these should be questions designed to capture why they feel the way they do about the lesson.)*

- \_\_\_\_\_ What did you see students doing (or hear them saying) that made you feel that way?
- \_\_\_\_\_ What do you recall about your own behavior during the lesson?
- \_\_\_\_\_ What part of your lesson do you feel did not go very well today? Why?
- \_\_\_\_\_ What did you do to make the lesson meaningful to your students?
- \_\_\_\_\_ What did you do to help the kids learn?
- \_\_\_\_\_ What do you think went well today and helped your students to learn?
- \_\_\_\_\_ What did you do to ensure that the students were learning?
- \_\_\_\_\_ Do you think if you increased your wait time it would have given more students time to respond to the question?

**3) Compare planned and performed teaching decisions and student learning.**

*(Ideally, these questions will collect information on their decision-making and/or lesson planning processes.)*

\_\_\_\_\_ How did what you observe compare with what you planned?

\_\_\_\_\_ How did you organize your material to teach the students?

\_\_\_\_\_ How did what you planned compare with what you did?

\_\_\_\_\_ What did you do to reinforce students' knowledge?

\_\_\_\_\_ What did you do within this lesson to motivate the learner?

**4) Infer relationships between student achievement and teacher decisions/behavior.**

*(Ideally, these questions will force exploration of the teacher role in the results of the lesson.)*

\_\_\_\_\_ As you reflect on the objectives of the lesson, what can you say about your students' achievement of them?

\_\_\_\_\_ How were you able to reinforce student learning in today's lesson?

\_\_\_\_\_ What were you thinking when you decided to change the design of the lesson?

\_\_\_\_\_ What were you aware of that students were doing that signaled you to change the format of the lesson?

\_\_\_\_\_ What did you do (or not do) that produced the results you wanted?

\_\_\_\_\_ What was your intention when you said " ".

\_\_\_\_\_ What hunches do you have to explain why some students performed as you had hoped while others did not?

\_\_\_\_\_ What did you do to see if the students were grasping the content of your lesson?

\_\_\_\_\_ How did you involve your students in your lesson?

**5) Synthesize new learning and prescribe applications.** *(These questions will help the teacher pull together their reflections from the conference into concrete ideas for improvement.)*

\_\_\_\_\_ How did you know when to ask a question or when to explain a question farther?

\_\_\_\_\_ As you reflect on this discussion, what big ideas or insights are you discovering?

\_\_\_\_\_ As you plan future lessons, what ideas have you developed that might be carried forth to the next lesson or other lessons?

\_\_\_\_\_ If you could change something in your lesson, what would you change?

\_\_\_\_\_ If you were to teach this lesson again, what would you do differently?

\_\_\_\_\_ What could you have done to enhance the lesson?

**6) Reflect on the coaching process and recommend refinements.** *(This is intended to be prescriptive so that the teacher can have a more tailored experience next time.)*

\_\_\_\_\_ As you think back over this conversation, what has this session done for you?

\_\_\_\_\_ What is it that I did or didn't do to assist you?

\_\_\_\_\_ What could I do differently in the future?

## REFERENCES

- Allen, D. W., & Eve, A. W. (1968). Microteaching. *Theory into Practice*, 7(5), 181-185.
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education* (8<sup>th</sup> Ed.). Belmont, CA: Wadsworth Cengage Learning.
- Ashton, P., & Crocker, L. (1986). Does teacher certification make a difference? *Florida Journal of Teacher Education*, 3, 73-83.
- Bain, J. D., Ballantyne, R., Packer, J., & Mills, C. (1999). Using journal writing to enhance student teachers' reflectivity during field experience placements. *Teachers and Teaching*, 5(1), 51-73.
- Ball, A. L., & Knobloch, N. A. (2005). A document analysis of the pedagogical knowledge espoused in agriculture teaching methods courses. *Journal of Agricultural Education*, 46(2), 47-57.
- Ballantyne, R., & Packer, J. (1995). Making connections: Using student journals as a teaching/learning aid. *HERDSA Gold Guide No 2*. Canberra, Australia: HERDSA.
- Bates, A. J., Ramirez, L., & Drits, D. (2009). Connecting university supervision and critical reflection: Mentoring and modeling. *The Teacher Educator*, 44(2), 90-112. doi:10. 1080/08878730902751993
- Bean, T., & Zulick, J. (1989). Using dialogue journals to foster reflective practice with preservice content-area teachers. *Teacher Education Quarterly*, 16(1), 33-40.
- Beck, R., King, A., & Marshall, S. (2002). Effects of videocase construction on preservice teachers observations of teaching. *The Journal of Experimental Education*, 70(4), 345-361.
- Bell, B., & Gilbert, J. (1994). Teacher development as personal, social and professional development. *Teaching and Teacher Education*, 10(5), 483-497.
- Ben-Peretz, M. (1984). Curriculum theory and practice in teacher education, In L. G. Katz, & J. D. Raths (Eds.), *Advances in teacher education* (pp. 9-27). Norwood, NJ: Ablex.
- Berliner, D., & Biddle, B. (1995). *The manufactured crisis: Myths, fraud, and the attack on America's public schools*. Reading, MA: Addison-Wesley.
- Beyer, L. (1984). Field experience, ideology, and the development of critical reflectivity. *Journal of Teacher Education*, 35(3), 36-41.

- Blanton, L. P., Sindelar, P. T., & Correa, V. I. (2006). Models and measures of beginning teacher quality. *The Journal of Special Education, 40*(2), 115-127.
- Bolin, F. S. (1988). Helping student teachers think about teaching. *Journal of Teacher Education, 39*(2), 48-54.
- Book, C., Byers, J., & Freeman, D. (1983). Student expectations and teacher education traditions with which we can and cannot live. *Journal of Teacher Education, 34*(13), 9-13.
- Borg, M. (2004). The apprenticeship of observation. *ELT Journal, 58*(3), 274-276.
- Borg, W. R., & Gall, M. D. (1989). *Educational research*. New York: Longman.
- Boud, D., Keogh, R., & Walker, D. (1985). Promoting reflection in learning: A model. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp. 18-40). London: Kogan Page.
- Boyd, E. M., & Fales, A. W. (1983). Reflective learning: Key to learning from experience. *Journal of Humanistic Psychology, 23*(2), 99-117.
- Bransford, J., Derry, S., Berliner, D., Hammerness, K., & Beckett, K. L. (2005). Theories of learning and their roles in teaching. In L. Darling-Hammond, & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 40-87). San Francisco: Jossey Bass.
- Brent, R., & Thompson, W. S. (1996). Videotaped microteaching: Bridging the gap from the university to the classroom. *The Teacher Educator, 31*, 238-47.
- Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey-Bass.
- Broughton, J. M. (1975). *The development of natural epistemology in years 11-16* (Unpublished doctoral dissertation). Harvard University Graduate School of Education, Boston.
- Buchmann, M. (1990). Beyond the lonely choosing will: Professional development in teacher thinking. *Teachers College Record, 91*(4), 481-508.
- Buchmann, M., & Schwile, J. (1983). Education: The overcoming of experience. *American Journal of Education, 92*(1), 30-51.
- Bullough, R. (1989). Teacher education and teacher reflectivity. *Journal of Teacher Education, 40*(2), 15-21.



- Calderhead, J. (1988). The development of knowledge structures in learning to teach. In J. Calderhead (Ed.), *Teachers' professional learning* (pp. 51-64). London: Falmer Press.
- Calderhead, J. (1989). Reflective teaching and teacher education. *Teaching and Teacher Education*, 5(1), 43-51.
- Calderhead, J. (1992). The role of reflection in learning to teach. In L. Valli (Ed.), *Reflective teacher education: Cases and critiques* (pp. 139-146). New York: State University of New York Press.
- Calderhead, J., & Gates, P. (1993). Introduction. In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 1-10). London: Falmer Press.
- Campbell, D. T., & Stanley J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand McNally College Publishing Co.
- Canning, C. (1990). *Reflection: Out on a limb. An interpersonal process and the development of voice*. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.
- Carr, S. (2006). The foundation programme assessment tools: An opportunity to enhance feedback to trainees? *Postgraduate Medical Journal*, 82, 576-579. doi: 10.1136/pgmj.2005.042366
- Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge, and action research*. London: Falmer Press.
- Cochran-Smith, M., & Lytle, S. (1993). *Inside/outside: Teacher research and knowledge*. New York: Teachers College Press.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (Rev. ed.). New York: Academic Press.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, J. & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2<sup>nd</sup> Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Collier, S. T. (1999). Characteristics of reflective thought during the student teaching experience. *Journal of Teacher Education*, 50(3), 173-181. doi: 10.1177/002248719905000303

- Colton, B., & Sparks-Langer, G. (1993). A conceptual framework to guide the development of teacher reflection and decision making. *Journal of Teacher Education, 44*(1), 45-54.
- Copeland, W. D., Birmingham, C., De la Cruz, E., & Lewin, B. (1993). The reflective practitioner in teaching: Toward a research agenda. *Teaching and Teacher Education, 9*(4), 347-359.
- Costa, A. (1995). New psychology of supervision. In G. Slick (Ed.), *Emerging trends in teacher preparation: The future of field experiences* (pp. 10-24). Thousand Oaks, CA: Corwin.
- Costa, A. & Garmston, R. (2002). *Cognitive coaching: A foundation for renaissance schools*. Norwood, Massachusetts: Christopher-Gordon, Inc.
- Cruikshank, D. R. (1984). *Models for the preparation of America's teachers*. Bloomington, IN: The Phi Delta Kappa Educational Foundation.
- Cruikshank, D. R. (1985). Uses and benefits of reflective teaching. *Phi Delta Kappan, 66*(10), 704-706.
- Cruikshank, D. R. (1987). *Reflective teaching*. Reston, VA: Association of Teacher Educators.
- Cruikshank, D. R. (1996). *Preparing America's teachers*. Bloomington, IN: The Phi Delta Kappa Educational Foundation.
- Cruikshank, D. R., & Metcalf, K. (1993). Improving preservice teacher assessment through on campus laboratory experiences. *Theory into Practice, 32*(2), 86-92.
- Cutler, B., Cook, P., & Young, J. (1989). The empowerment of preservice teachers through reflective teaching. Paper presented at the annual meeting of the Association of Teacher Educators, St. Louis.
- Darling-Hammond, L., Fickel, L., Koppich, J., Macdonald, M., Merseth, K., Miller, L.,...& Zeichner, K. (2006). *Powerful teacher education: Lessons from exemplary programs*. San Francisco: Jossey-Bass.
- Darling-Hammond, L., & Snyder, J. (2000). Authentic assessment of teaching in context. *Teaching and Teacher Education, 16*(5-6), 523-545.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- DeLay, A. M., Washburn, S. G., & Ball, A. L. (2008). *Enhancing preservice agriculture teachers' reflective practice using the structured field experience*. Paper presented at the 35<sup>th</sup> AAAE research conference, Reno, NV.

- Dewey, J. (1910). *How we think*. Boston: D. C. Heath and Co.
- Dewey, J. (1933). *How we think: A restatement of the relations of reflective thinking to the educative process*. Boston: Heath and Co.
- Dicker, M. (1990). Using action research to navigate an unfamiliar teaching assignment. *Theory into Practice*, 29, 203-208.
- Dinkelman, T. (1997). The promise of action research for critically reflective teacher education. *Teacher Educator*, 32(4), 250-274.
- Dymoke, S., & Harrison, J. (Eds.). (2008). *Reflective Teaching and Learning: A guide to professional issues for beginning secondary teachers*. London: SAGE.
- Edwards, J. L. (1993). The effect of cognitive coaching on the conceptual development and reflective thinking of first year teachers. *Dissertation Abstracts International*, 40 (12).
- Elbaz, F. (1983). *Teacher thinking: A study of practical knowledge*. London: Croom Helm.
- Elbaz, F. (1988). Critical reflections on teaching: Insights from Freire. *Journal of Education for Teaching*, 14, 171-181.
- Eraut, M. (1985). Knowledge creation and knowledge use in professional contexts. *Studies in Higher Education*, 10, 117-133.
- Evertson, C., Hawley, W., & Zlotnik, M. (1985). Making a difference in educational quality through teacher education. *Journal of Teacher Education*, 36(3), 2-12.
- Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record*, 103(6), 1013-1055.
- Feiman-Nemser, S., & Buchmann, M. (1985). Pitfalls of experience in teacher preparation. *Teachers College Record*, 81(1), 53-65.
- Fendler, L. (2003). Teacher reflection in a hall of mirrors: Historical influences and political reverberations. *Educational Researcher*, 32(3), 16-25.
- Field, J. C., & Latta, M. M. (2001). What constitutes becoming experienced in teaching and learning? *Teaching and Teacher Education*, 17, 885-895.
- Flickinger, G. G., & Ruddy, M. (1992). Off site/reflective conferences: University supervisors and student teachers. *The Teacher Educator*, 28(2), 2-9.

- Fragler, A. M. (1985). Video technology in teacher training: A research perspective. *Educational Technology, 25*(7), 20-22.
- Francis, D. (1995). The reflective journal: A window to preservice teachers' practical knowledge. *Teaching and Teacher Education, 11*(3), 229-241.
- Fullan, M. (1999). *Change forces: The sequel*. London: Falmer Press.
- Gallien, T., & Oomen-Early, J. (2008). Personalized versus collective instructor feedback in the online classroom: Does type of feedback affect student satisfaction, academic performance, and perceived connectedness with the instructor? *International Journal on E-learning, 7*(3), 463-476.
- Garmston, R., Linder, C., & Whitaker, J. (1993). Reflections on cognitive coaching. *Educational Leadership, 51*(3), 57-61.
- Gielen, S., Dochy, F., & Dierick, S. (2003). Evaluating the consequential validity of new modes of assessing the influence of assessment on learning, including pre-, post- and true assessment effects. In M. Sigers (Ed.), *Optimising new modes of assessment: In search of qualities and standards* (pp. 37-54). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Gillespie, M. L. (1996). Stories, cases, and practical wisdom. *Innovative Higher Education, 21*(1), 49-66.
- Gilstrap, D. L. & Dupree, J. (2008). A regression model of predictor variables on critical reflection in the classroom: Integration of the critical incident questionnaire and the framework for reflective thinking. *The Journal of Academic Librarianship, 34*(6), 469-481. doi:10.1016/j.acalib.2008.09.019
- Ginsburg, M. B., & Clift, R. T. (1990). The hidden curriculum of preservice teacher education. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 450-465). New York: Macmillan.
- Gitlin, A., & Teitelbaum, K. (1983). Linking theory and practice: The use of ethnographic methodology by prospective teachers. *Journal of Education for Teaching, 9*, 225-234.
- Glanz, J., & Sullivan, S. (2000). *Supervision in practice: 3 steps to improving teaching and learning*. Thousand Oaks, CA: Corwin Press, Inc.
- Glen, S. (1995). Reflecting on reflection: A personal encounter. *Nurse Education Today, 15*(1), 61-68.
- Goodlad, J. I. (1990). *Teachers for our nation's schools*. San Francisco: Jossey-Bass.

- Griffiths, M., & Tann, S. (1992). Using reflective practice to link personal and public theories. *Journal of Education for Teaching*, 18(1), 69-84.
- Grimmett, P., & Erickson, G. (Eds.). (1988). *Reflection in teacher education*. New York: Teachers College Press.
- Grimmett, P. P., Erickson, G. L., Mackinnon, A. M., & Riecken, T. J. (1990). Reflective practice in teacher education. In R. T. Clift, W. R. Houston, & M. C. Pugach (Eds.), *Encouraging reflective practice in education: An analysis of issues and programs* (pp. 20-38). New York: Teacher College Press.
- Guyton, E., & McIntyre, J. (1990). Student teaching and school experiences. In W. R. Houston, M. Haberman, & J. Sikula (Eds.), *Handbook of research on teacher education* (pp. 514-534). New York: Macmillan.
- Hackman, M. Z., & Walker, K. B. (1990). Instructional communication in the televised classroom: The effects of system design and teacher immediacy on student learning and satisfaction. *Communication Education*, 39(3), 196-206.
- Han, E. P. (1995). Reflection is essential in teacher education. *Childhood Education*, 71(4), 228-230.
- Handal, G., & Lauvas, P. (1987). *Promoting reflective teaching: Supervision in action*. Milton Keynes: Society for Research in Higher Education and Open University Press.
- Harrington, H. L., Quinn-Leering, K., & Hodson, L. (1996). Written case analyses and critical reflection. *Teaching and Teacher Education*, 12, 25-27.
- Harris, K., Jenz, F., & Baldwin, G. (2005). *Who's teaching science? Meeting the demand for qualified science teachers in Australian secondary schools*. Centre for the Study of Higher Education: The University of Melbourne. Accessed from <http://www.acds.edu.au/docs/teachsci.pdf>
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81-112. doi: 10.3102/003465430298487.
- Hatton, N., & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. *Teaching and Teacher Education*, 11(1), 33-49. doi:10.1016/0742-051X(94)00012-U
- Heron, J. (1990). *Helping the client: A creative practical guide* (4<sup>th</sup> Ed.). London: Sage Publications.

- Hillkirk, K., & Dupuis, V. L. (1989). Outcomes of a teacher education curriculum module that emphasizes inquiry and reflection. *The Teacher Educator*, 24(3), 20-27.
- Hoban, G. F. (2000). Making practice problematic: Listening to student interviews as a catalyst for teacher reflection. *Asia-Pacific Journal of Teacher Education*, 28(2), 133-147.
- Hoban, G., & Hastings, G. (2006). Developing different forms of student feedback to promote teacher reflection: A 10 year collaboration. *Teaching and Teacher Education*, 22, 1006-1019. doi: 10.1016/j.tate.2006.04.006
- Holly, M. (1984). *Keeping a personal-professional journal*. Geelong, Australia: Deakin University Press.
- Horton, L. (1972). The hidden curriculum of competency based teacher education. Unpublished manuscript. (ED 080 511)
- Huck, S. W. (2008). *Reading statistics and research* (5<sup>th</sup> Ed.). Boston: Pearson.
- Jackson, P. (1968). *Life in classrooms*. New York: Holt, Rinehart and Winston.
- Kagan, D. M. (1992). Professional growth among preservice and beginning teachers. *Review of Educational Research*, 62(2), 129-169. doi: 10.3102/00346543062002129
- Kember, D., Jones, A., Loke, A., McKay, J., Sinclair, K., Tse, H., ... Yueng, E. (1999). Determining the level of reflective thinking from students' written journals using a coding scheme based on the work of Mezirow. *International Journal of Lifelong Education*, 18(1), 18-30.
- Kember, D., Jones, A., Loke, A. Y., McKay, J., Sinclair, K., Tse, H., ... Yeung, E. (2001). *Reflective teaching and learning in the health professions: Action research in professional education*. Oxford: Blackwell Science Ltd.
- Kember, D., Leung, D. Y. P., Jones, A., Loke, A. Y., McKay, J., Sinclair, K., ... Yeung, E. (2000). Development of a questionnaire to measure level of reflective thinking. *Assessment and Evaluation in Higher Education*, 25(4), 381-395.
- Kember, D., McKay, J., Sinclair, K., & Wong, F. K. Y. (2008). A four-category scheme for coding and assessing the level of reflection in written work. *Assessment and Evaluation in Higher Education*, 33(4), 369-379. doi: 10.1080/02602930701293355
- Kemmis, S., & McTaggart, R. (1988). *The action research planner* (3<sup>rd</sup> Ed.). Victoria, Australia: Deakin University.

- Kennedy, M. M. (2005). *Inside teaching: How classroom life undermines reform*. Cambridge, MA: Harvard University Press.
- King, P., & Kitchener, K. (1994). *Developing reflective judgment*. San Francisco: Jossey Bass.
- Kirby, P. C., & Teddlie, C. (1989). Development of the reflective teaching instrument. *Journal of Research and Development in Education*, 22, 45-51.
- Kluger, A. N., & DeNisis, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis and a preliminary feedback intervention theory. *Psychological Bulletin*, 11, 254-284. doi:10.1037/0033-2909.119.2.254
- Knight, B. (1996). Reflecting on reflective practice. *Studies in the Education of Adults*, 28(2), 162.
- Knowles, J. G. (1993). Life history accounts as mirrors: A practical avenue for the conceptualization of reflection in teacher education. In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 70-92). London: Falmer Press.
- Kolb, D. A. (1984). *Experiential learning*. Englewood Cliffs, NJ: Prentice-Hall.
- Korthagen, F. A. J. (1988). The influence of learning orientations on the development of reflective teaching. In J. Calderhead (Ed.), *Teachers' professional learning* (pp. 35-50). Lewes: Falmer Press.
- Korthagen, F. A. J. (1999). Linking reflection and technical competence: The logbook as an instrument in teacher education. *European Journal of Teacher Education*, 22(2-3), 191-207.
- Koskela, R. (1985). A search for reflective thought in the student teaching seminar: A case study. Unpublished doctoral dissertation, University of Wisconsin, Madison.
- LaBoskey, V. K. (1993). A conceptual framework for reflection in preservice teacher education. In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 23-38). London: Falmer Press.
- LaBoskey, V. K., & Wilson, S. M. (1987). *Case writing as a method in preservice teacher education*. Paper presented at the annual meeting of the American Educational Research Association, Washington D. C.
- Lalik, R. V., Niles, J. A., & Murphy, S. B. (1989). *Using your head and your heart: A study of the process for promoting reflection among student teachers*. Paper

presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

- Lampert, M., & Clark, C. (1990). Expert knowledge and expert thinking in teaching: A response to Floden and Klinzing. *Educational Researcher*, 19(5), 21-23.
- Laursen, P. F. (1994). Teacher thinking and didactics: Prescriptive, rationalistic and reflective approaches. In I. Carlgren, G. Handal, & S. Vaage (Eds.), *Teachers' minds and actions: Research on teachers' thinking and practice* (pp. 125 -135). London: Falmer Press.
- Lee, H. J. (2005). Understanding and assessing preservice teachers' reflective thinking. *Teaching and Teacher Education*, 21(6), 699-715. doi:10.1016/j.tate.2005.05.007
- Leung, D. Y. P., & Kember, D. (2003). The relationship between approaches to learning and reflection upon practice. *Educational Psychology*, 23(1), 61-71. doi: 10.1080/0144341022000022933
- Liston, D. P., & Zeichner, K. M. (1987). Reflective teacher education and moral deliberation. *Journal of Teacher Education*, 38(6), 2-8. doi: 10.1177/002248718703800601
- Litke, R. A. (2002). Do all students "get it?" Comparing students' reflections to course performance. *Michigan Journal of Community Service Learning*, 8(2), 27-34.
- Lortie, D. (1975). *School teacher: A sociological study*. London: University of Chicago Press.
- Lynch, M., & Metcalfe, M. (2006). Reflection, pragmatism, concepts, and intuition. *Journal of Information Technology Theory and Application*, 7(4), 1-10.
- MacKinnon, A. (1987). Detecting reflection-in-action among preservice elementary science teachers. *Teaching and Teacher Education*, 3(2), 135-145.
- Marshall, H. (1990). Metaphors: an instructional tool in encouraging student teacher reflection. *Theory into Practice*, 29, 128-132.
- Mason, B. J., & Bruning, R. (1999). *Providing feedback in computer based instruction: What the research tells us*. Retrieved from University of Nebraska Lincoln Center for Instructional Innovation: <http://dwb.unl.edu/Edit/MB/MasonBruning.html>
- Melville, W., Fazio, X., Bartley, A., & Jones, D. (2008). Experience and reflection: Preservice science teachers' capacity for teaching inquiry. *Journal of Science Teacher Education*, 19(5), 477-494. doi:10.1007/s10972-008-9104-9



- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass, Inc.
- Mezirow, J. (1998). On critical reflection. *Adult Education Quarterly*, 48(3), 185-198.
- Morton, F., Dall'Alba, G., Beaty, E. (1993). Conceptions of learning. *International Journal of Educational Research*, 19(3), 277-300.
- Mory, E. (2004). Feedback research revisited. In D. J. Jonassen (Ed.), *Handbook of research on educational communications and technology*. Mahwah, NJ: Lawrence Erlbaum.
- Mule, L. (2006). Preservice teachers' inquiry in a professional development school context: Implications for the practicum. *Teaching and Teacher Education*, 22(2), 205-218.
- Murray, F. (1986). Goals for the reform of teacher education: An executive summary of the Holmes Group report. *Phi Delta Kappan*, 68(1), 28-32.
- McIntyre, D. (1988). Designing a teacher education curriculum from research and theory on teacher knowledge. In J. Calderhead (Ed.), *Teachers' professional learning* (pp. 97-114). London: Falmer Press.
- McIntyre, D. (1991). *The utilization of laboratory experiences in undergraduate teacher education programs*. Paper presented to the Association of Teacher Educators, New Orleans.
- McIntyre, D. (1993). Theory, theorizing, and reflection in initial teacher education. In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 39-52). London: Falmer Press.
- McLean, R. C., & Camp, W. G. (2000). An examination of selected preservice agricultural teacher education programs in the United States. *Journal of Agricultural Education*, 41(2), 25-35.
- McNamara, D. (1990). Research on teachers thinking: Its contribution to educating student teachers to think critically. *Journal of Education for Teaching*, 16(2), 147-160.
- National Education Association (NEA). *Research Spotlight on Recruiting & Retaining Highly Qualified Teachers*. Retrieved August 14, 2009 from <http://www.nea.org/tools/17054.htm>
- Newcomb, L. H., McCracken, J. D., Warmbrod, J. R., & Whittington, M. S. (2004). *Methods of teaching agriculture* (3<sup>rd</sup> Ed.). Danville, IL: Interstate Publishers, Inc.

- Noffke, S. E., & Brennan, M. (1988). *The dimensions of reflection: A conceptual and contextual analysis*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA
- Noordhoff, K., & Kleinfeld, J. (1990). Shaping the rhetoric of reflection for multicultural settings. In R. T. Clift, W. R. Houston, & M. C. Pagach (Eds.), *Encouraging reflective practice in education: An analysis of issues and programs* (pp. 97-118). New York: Teachers College Press.
- Oberg, A., & McCutcheon, G. (1989). Teachers' experience doing action research. *Peabody Journal of Education*, 64, 116-127.
- Olsen, D. G. (1985). The quality of perspective teachers: Education versus non-education graduates. *Journal of Teacher Education*, 36(5), 56-59.
- Ovando, M. N., & Harris, B. M. (1993). Teachers' perceptions of the post-observation conference: Implications for formative evaluation. *Journal of Personnel Evaluation in Education*, 7, 301-310.
- Parsons, M., & Stephenson, M. (2005). Developing reflective practice in student teachers: Collaborative and critical partnerships. *Teachers and Teaching: Theory and Practice*, 11(1), 95-116.
- Pee, B., Woodman, T., Fry, H., & Davenport, E. S. (2002). Appraising and assessing reflection in students' writing on a structured worksheet. *Medical Education*, 36(6), 575-585. doi: 10.1046/j.1365-2923.2002.01227.x
- Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart and Winston.
- Poulos, A., & Mahony, M. J. (2008). Effectiveness of feedback: The students' perspective. *Assessment & Evaluation in Higher Education*, 33(2), 143-154.
- Professional Standards for the Accreditation of Teacher Education Institutions. (2008). Washington, D.C.: National Center for Accreditation of Teacher Education. Retrieved on July 13, 2009, from <http://www.ncate.org/documents/standards/NCATE%20Standards%202008.pdf>
- Pugach, M. (1990). *Self-study: The genesis of reflection in novice teachers*. Paper presented at the annual meeting of the American Educational Research Association, Boston.
- Pultorak, E. G. (1993). Facilitating reflective thought in novice teachers. *Journal of Teacher Education*, 44(4), 288-295.

- Raelin, J. (2001). Public reflection as the basis of learning. *Management Learning*, 32(1), 11-30.
- Reiman, A. J. (1999). The evolution of the social roletaking and guided reflection framework in teacher education: Recent theory and quantitative synthesis of research. *Teaching and Teacher Education*, 15, 597-612.
- Reynolds, M. (1998). Reflection and critical reflection in management learning. *Management Learning*, 29(2), 183-200.
- Rhine, S. (1998). The role of research and teachers' knowledge base in professional development. *Educational Researcher*, 27(5), 27-31.
- Richardson, V. (Ed.). (1994). *A theory of change and the staff development process*. New York: Teachers College Press.
- Richert, A. (1990). Teaching teachers to reflect: A considerations of programme structure. *Journal of Curriculum Studies*, 22(6), 509-527.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842-866.
- Rosaen, C. L., Lundeberg, M., Cooper, M., Fritzen, A., & Terpstra, M. (2008). Noticing noticing: How does investigation of video records change how teachers reflect on their experiences? *Journal of Teacher Education*, 29(5), 347-360.  
doi:10.1177/0022487108322128
- Rosenshine, B., & Furst, N. (1971). Research on teacher performance criteria. In B. O. Smith (Ed.), *Research in teacher education* (pp. 37-72). Eaglewood Cliffs, NJ: Prentice-Hall, Inc.
- Ross, D. (1989). First steps in developing a reflective approach. *Journal of Teacher Education*, 40, 22-30.
- Ross, D. D. (1990). Programmatic structures for the preparation of reflective teachers. In R. T. Clift, W. R. Houston, & M. C. Pagach (Eds.), *Encouraging reflective practice in education: An analysis of issues and programs* (pp. 97-118). New York: Teachers College Press.
- Rudduck, J. (1984). *Teaching as an art: Teacher research and research-based teacher education*. Second Annual Lawrence Stenhouse Memorial Lecture, University of East Anglia.
- Russell, T. (1993). Critical attributes of a reflective teacher: Is agreement possible? In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 144-153). London: Falmer Press.

- Schlagal, B., Trathen, W., & Blanton, W. (1996). Structuring telecommunications to create instructional conversations about student teaching. *Journal of Teacher Education, 46*(3), 175-183.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey Bass.
- Schön, D. A. (1988). Coaching reflective teaching. In P. Grimmett, & G. Erickson (Eds.), *Reflection in teacher education* (pp. 19-30). New York: Teachers College Press.
- Sebran, M. A. (1989). *A case study of reflection in one novice physical education teacher: The development of attitude and process*, Paper presented at the R. Tait McKenzie Symposium on Sport, Knoxville, TN.
- Sewall, M. (2009). Transforming supervision: Using video elicitation to support preservice teacher-directed reflective conversations. *Issues in Teacher Education, 18*(2), 11-30.
- Sexton, J. S., Raven, M. R., & Newman, M. E. (2002). A comparison of traditional and World Wide Web methodologies, computer anxiety, and higher order thinking skills in the in-service training of Mississippi 4-H extension agents. *Journal of Agricultural Education, 43*(3), 25-36.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin Company.
- Sherin, M. G., & Van Es, E. (2005). Using video to support teachers' ability to notice classroom interactions. *Journal of Technology and Teacher Education, 13*(3), 475-491.
- Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*, 1-22.
- Shulman, L. (1988). Teaching along, learning together: needed agendas for new reform. In T. J. Sergiovanni, & J. H. Moore (Eds.), *Schooling for tomorrow: Directing reform to issues that count* (pp. 156-187). Boston: Allyn & Bacon.
- Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153-189. doi: 10.3102/0034654307313795

- Sikes, P., & Aspinwall, K. (1990). *Time to reflect: Biographical study, personal insight and professional development*. Paper presented at the annual meeting of the American Educational Research Association, Boston MA.
- Simmons, J. M., & Schuette, M. K. (1988). Strengthening teacher reflective decision-making. *Journal of Staff Development*, 9(3), 18-27.
- Smith, D. (1991). Educating the reflective practitioner in curriculum. *Curriculum*, 12, 115-124.
- Smith, D., & Hatton, N. (1992). *Towards critical reflection in teacher education*. Paper presented to the annual conference of the Australian Teacher Education Association, Ballina.
- Smith, D., & Hatton, N. (1993). Reflection in teacher education: A study in progress. *Education Research and Perspectives*, 20, 13-23.
- Smith, D., & Lovat, T. (1991). *Curriculum: Action on reflection* (2<sup>nd</sup> Ed.). Wentworth Falls, N.S.W.: Social Science Press.
- Smyth, J. (1989). Developing and sustaining critical reflection in teacher education. *Journal of Teacher Education*, 40(2), 2-9. doi: 10.1177/00224871890400020
- Smyth, J. (1992). Teachers' work and the politics of reflection. *American Educational Research Journal*, 29(2), 267-300.
- Sparkes, A. (1991). The culture of teaching, critical reflection, and change: Possibilities and problems. *Educational Management and Administration*, 19, 4-19.
- Sparks-Langer, G., & Colton, A. (1991). Synthesis of research on teachers' reflective thinking. *Educational Leadership*, 48(6), 37-44.
- Stein, D. (2000). *Teaching critical reflection*. Accessed on October 31, 2009 from <http://www.inspiredliving.com/business/reflection.htm>
- Stoiber, K. (1990). The effect of technical and reflective instruction on pedagogical reasoning and problem solving. *Journal of Teacher Education*, 42(2), 131-139.
- Surbeck, E., Park-Han, E., & Moyer, J. (1991). Assessing reflective responses in journals. *Educational Leadership*, 48(6), 25-37.
- Thalheimer, W., & Cook, S. (2003). *How to calculate effect sizes from published research articles: A simplified methodology*. Retrieved December 19, 2009 from [http://work-learning.com/effect\\_size\\_download.htm](http://work-learning.com/effect_size_download.htm)

- Thomas, L., Clift, R. T., & Sugimoto, T. (1996). Telecommunication, student teaching, and methods instruction: An exploratory investigation. *Journal of Teacher Education, 47*, 165-174.
- Tom, A. (1985). Inquiring into inquiry-oriented teacher education. *Journal of Teacher Education, 36*(5), 35-44.
- Torres, R. M. (2009). *Diagram of surface similarity based on generalized causal inference*. Unpublished powerpoint from Ag Ed 8087: Experimental Designs, Department of Agricultural Education, University of Missouri, Columbia, Missouri.
- Tripp, D. (1987). *Theorizing practice: The teacher's professional journal*. Geelong, Australia: Deakin University Press.
- Tripp, D. (1993). *Critical incidents in teaching: Developing professional judgment*. London: Routledge.
- Valli, L. (1992). *Reflective teacher education: Cases and critiques*. Albany: SUNY Press.
- Valli, L. R. (1993). Reflective teacher education programs: An analysis of case studies. In J. Calderhead, & P. Gates (Eds.), *Conceptualizing reflection in teacher development* (pp. 11-22). London: Falmer Press.
- van der Vleuten, C., & Schuwirth, L. W. T. (2005). Assessing professional competence: From methods to programmes, *Medical Education, 39*, 309-317.  
doi:10.1111/j.1365-2929.2005.02094.x
- Van Es, E., & Sharin, M. (2002). Learning to notice: Scaffolding new teachers' interpretations of classroom interactions. *Journal of Technology and Teacher Education, 10*(4), 571-596.
- Van Manen, M. (1977). Linking way of knowing with ways of being practical. *Curriculum Inquiry, 6*(3), 205-228.
- Vince, R. (1998). Behind and beyond Kolb's learning cycle. *Journal of Management Education, 22*(3), 304-319.
- Wade, S. E., Allison, V., & Stevens, T. (2000). *A study of the dialogue among preservice teachers on the internet*. Paper presented at the annual meeting of the American Education Research Association, New Orleans.
- Wang, J. & Hartley, K. (2003). Video technology as a support for teacher education reform. *Journal of Technology and Teacher Education, 11*(1), 105-138.

- Ward, J. R., & McCotter, S. S. (2004). Reflection as a visible outcome for pre-service teachers. *Teaching and Teacher Education, 20*, 243-257. doi:10.1016/j.tate.2004.02.004
- Wedman, J., Martin, M., & Mahlios, M. (1990). Effect of orientation, pedagogy, and time on selected student teaching outcomes. *Action in Teacher Education, 13*(2), 15-23.
- Weiss, J., & Loudon, W. (1989). *Images of reflection*. Perth, Australia: The Ontario Institute for Studies in Education (Toronto, Ontario, Canada) and the Ministry of Education, Western Australia.
- Westerman, D., & Smith, S. (1993). *A research model for the clinical supervision of student teachers*. Paper presented at the meeting of the American Association of Colleges for Teacher Education, San Diego, CA. Retrieved from ERIC ED361282.
- What teachers should know and be able to do: National Board for Professional Teaching Standards*. (August 2002). Retrieved on July 13, 2009, from [http://www.nbpts.org/UserFiles/File/what\\_teachers.pdf](http://www.nbpts.org/UserFiles/File/what_teachers.pdf)
- Whipp, J. L. (2003). Scaffolding critical reflection in online discussions: Helping prospective teachers think deeply about field experiences in urban schools. *Journal of Teacher Education, 54*, 321-333. doi:10.1177/0022487103255010
- Whitmire, E. (1998). Development of critical thinking skills: An analysis of academic library experiences and other measures. *College and Research Libraries, 59*(3), 266-273.
- Wildman, T. M., Magliaro, S. G., Niles, J. A., & McLaughlin, R. A. (1990). Promoting reflective practice among beginning and experienced teachers. In R. T. Clift, W. R. Houston, & M. C. Pagach (Eds.), *Encouraging reflective practice in education: An analysis of issues and programs* (pp. 97-118). New York: Teachers College Press.
- Wildman, T. M., & Niles, J. A. (1987). Reflective teachers: Tensions between abstractions and realities. *Journal of Teacher Education, 38*(4), 25-31.
- Wilson, S. M., Floden, R. E., & Ferrini-Mundy, J. (2001). *Teacher preparation research: Current knowledge, gaps, and recommendations: A research report prepared for the U.S. Department of Education*. Seattle: Center for the Study of Teaching and Policy.
- Winitzky, N., & Arends, R. (1991). Translating research into practice: The forms of training and clinical experience on preservice students' knowledge, reflectivity, and behavior. *Journal of Teacher Education, 42*(1), 52-65.

- Witherell, C., & Makler, A. (1989). *Giving each other reason: Building a community of inquirers through collaborative teacher education*. Paper presented at the annual meeting of the American Education Research Association, San Francisco, CA.
- Woods, P. (1993). *Critical events in teaching and learning*. Washington, DC: Falmer Press.
- Wong, F. K. Y., Kember, D., Chung, L. Y. F., & Yan, L. (1995). Assessing the level of reflection from reflective journals. *Journal of Advanced Nursing*, 22(1), 45-57.
- Yang, S. (2009). Using blogs to enhance critical reflection and community of practice. *Educational Technology and Society*, 12(2), 11-21.
- Yinger, R. J. (1990). The conversation of practice. In R. T. Clift, W. R. Houston, & M. C. Pugach (Eds.), *Encouraging reflective practice in education* (pp. 73-96). New York: Teacher College Press.
- Yost, D. S., Sentner, S. M., & Forlenza-Bailey, A. (2000). An examination of the construct of critical reflection: Implications for future teacher education programming in the 21<sup>st</sup> century. *Journal of Teacher Education*, 51(1), 39-49.
- Zeichner, K. M. (1986). Preparing reflective teachers: An overview of instructional strategies which have been employed in preservice teacher education. *Journal of Teacher Education*, 38(4), 25-31.
- Zeichner, K. M. (1994). Research on teacher thinking and different views of reflective practice in teaching and teacher education. In I. Carlgren, G. Handal, & S. Vaage, *Teachers' minds and actions: Research on teachers' thinking and practice* (pp. 9-27). London: Falmer Press.
- Zeichner, K. M. (1996). Teachers as reflective practitioners and the democratization of school reform. In K. M. Zeichner, S. Melnick, & M. L. Gomez (Eds.), *Currents of reform in preservice teacher education* (pp. 199-214). New York: Teachers College Press.
- Zeichner, K. M., & Liston, D. P. (1987). Teaching student teachers to reflect. *Harvard Educational Review*, 57(1), 23-48.
- Zeichner, K., & Liston, D. (1990). *Traditions of reform and reflective teaching in US teacher education* (Issue paper 90-1) East Lansing, MI: National Center for Research on Teacher Education.
- Zeichner, K. M., & Tabachnick, B. R. (1991). Reflections on reflective teaching. In B. R. Tabachnick and K. M. Zeichner (Eds.), *Issues and practices in inquiry oriented teacher education* (pp. 1-21). London: Falmer Press.



Zygouris-Coe, V., Pace, B., Malecki, C., & Weade, R. (2001). Action research: A situated perspective. *Qualitative studies in Education*, 14(3), 399-412.

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