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LIVED EXPERIENCES OF MEDICAL LABORATORY SCIENCE CLINICAL INSTRUCTORS AS ADULT LEARNERS

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Education
in the Graduate School of the
University of Missouri - St. Louis

October 2011

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Abstract

Physicians and patients trust the medical laboratory science (MLS) professionals performing laboratory tests, assuming that they are competent. The education of these professionals includes time spent in clinical rotations; weeks that students spend alongside their clinical instructors who are practicing professionals. When they first have students to teach, these clinical instructors have little or no experience or training in how to conduct clinical instruction. This research examined how medical laboratory science clinical instructors learn to conduct clinical instruction.

In order to describe the phenomenon of clinical instructors learning to conduct clinical instruction, a mixed methods approach was used. In the first phase, a questionnaire was distributed to clinical instructors at hospital affiliates of six Midwest university programs of medical laboratory science. Informed by these data, the researcher conducted interviews in the second phase. Six MLS clinical instructors were interviewed to explore more deeply how they learn to conduct clinical instruction. These data were analyzed for recurrent themes. The culmination of the research was a thick, rich description of the phenomenon of how medical laboratory scientists learn to conduct clinical instruction. In addition, six themes were identified: 1) clinical instructors use experience as a learning resource; 2) clinical instructors learn in order to solve problems and they apply their learning for immediate use; 3) clinical instructors use a variety of methods to learn how to do clinical instruction; 4) some clinical instructors have a natural ability for teaching but some do not; 5) clinical instructors must learn to teach with less time; and 6) clinical instructors vary in their self-directedness and internal motivation.

The research showed that medical laboratory science clinical instructors act as adult learners by using their experiences as students, experiences as instructors, and life experiences to learn clinical instruction. As adult learners, they are focused on learning in order to solve problems, learning for immediate application. Clinical instructors learn clinical instruction by a variety of methods. With increasing stress and workload, clinical instructors in medical laboratories, however, find it difficult to concentrate on learning to teach students.

This research answers the questions, “What does a clinical instructor do to learn clinical instruction?” and “What experiences do clinical instructors call upon to help them in learning to be clinical instructors?” and “What, if any, adult learning principles do clinical instructors use in learning clinical instruction?” These answers illuminate the ways in which clinical instructors of medical laboratory science students learn to conduct clinical instruction. By understanding how clinical instructors learn, hospital management and university MLS programs will be better prepared to support new clinical instructors in their initial learning and experienced clinical instructors in their lifelong learning. The quality of instruction of our medical laboratory science students depends on how well clinical instructors learn how to conduct clinical instruction.

Acknowledgements

My sincere gratitude to the clinical instructors who participated in this research. Without their time and efforts, this would not have been possible. Now I appreciate even more the clinical instructors who teach our medical laboratory students at the bench.

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Chapter 1

Introduction

Allied health professions provide a critical part of health care. Only 40 percent of health care professionals are doctors and nurses. Over 80 allied health professions make up the rest of health care professionals (Department of Labor, 2008). Medical laboratory science (MLS), also called clinical laboratory science or medical technology, is one of these professions. Physicians and patients trust the allied health professionals performing laboratory tests, assuming that they are competent. Laboratory data are involved in 70% of the critical decisions physicians make (Forsman, 1996), making it critical that the data are accurate. Competent laboratory professionals assure the accuracy of the laboratory results reported to physicians.

The education of these professionals includes time spent in clinical rotations; weeks that students spend alongside practicing professionals. Clinical rotations are critically important for the development of skills that cannot be provided in the academic setting. Students are also exposed to complex instrumentation that is not available in student laboratories on campus. Wetherbee, Nordrum, and Giles (2008) explained the importance of this clinical experience for physical therapy students (and all allied health students):

> These experiences afford students the opportunity to synthesize classroom learning with clinical situations involving real patients. In turn, this process allows students to develop critical thinking, clinical decision making skills, psychomotor skills, appropriate communication and affective behaviors, thereby making clinical education a critical component of the professional development of PT students. (p. 65)

Instructors who teach and supervise students in these rotations are the gatekeepers of the professions. Lenburg (1979) confirmed the importance of this role, “In nursing programs faculties assure the public that the graduates of their programs are competent to practice nursing.... Nursing faculties find themselves in a vulnerable position when asked to defend the product produced in their programs” (p. xi). This holds true for allied health professions also. Although each profession has certification examinations which graduates must pass to practice in the profession, certification examinations cannot fully ascertain whether a person has the skills and attitudes necessary to be a competent professional. These exams ask questions about didactic material and about scenarios that occur in practice; however, they do not have practical, hands on components. This is why the applicants must have either successfully completed an accredited educational program or have certain educational and experiential requirements before they can take the certification examinations. This puts the clinical instructors who teach, supervise, and evaluate the students in a very critical position regarding entry into the profession.

Clinical instructors, as defined in this research, are employees of the health care facility which is affiliated with an educational institution. This research looks in particular at clinical instructors in the profession of medical laboratory science. Medical laboratory scientists perform medical laboratory tests such as chemistry tests for heart attacks or liver disease, toxicology, bacterial cultures, compatibility tests for transfusions, or microscopic examination of blood. On top of performing lab tests, clinical instructors instruct one or more students during the clinical rotations. This rotation may last from a couple days to several weeks. Clinical instructors are responsible for showing the students how to perform the work and connecting the theory they have learned on campus with the practice in the clinical setting.

In the medical laboratory employees are typically assigned to be clinical instructors. An employee does not need to apply or be vetted in order to be a clinical instructor. The determination of which laboratory staff will be a clinical instructor is not standardized throughout the profession. Most often, medical laboratory scientists are assigned to be clinical instructors based upon their work assignments. For example, if a student is scheduled to be learning blood gases, the person scheduled to be doing blood gases that day will be the clinical instructor. In most laboratories which accept students, the generic job description for all medical laboratory scientists includes instruction of students at the bench (on the job). The assignment of students is either done by the department supervisor or a facilitator/clinical coordinator, an employee of the health care institution who serves as a coordinator and intermediary between the university and the laboratory. Some places require that persons serving as clinical instructors have one year of experience on the job. Many times the clinical instructor is responsible for a full work load in addition to instructing the student. Being a clinical instructor in the medical laboratory results in little or no prestige or recognition. In allied health professions such as radiography, where there is a selection process for becoming a clinical instructor, there is more prestige associated with the role.

Currently, a shortage of allied health professionals exists. The shortage makes it important for more laboratory professionals to enter the work force. Yet the shortage also makes it more difficult for the clinical instructors to find time to teach students on top of performing their increased laboratory responsibilities. For the clinical laboratory the United States Department of Labor projects that approximately 15,000 will be needed each year through 2014, however currently only around 5,000 individuals are graduating from accredited educational programs each year (Department of Labor, 2008; National Accrediting Agency for Clinical

Laboratory Sciences [NAACLS], 2008). "The current vacancy rate in the clinical laboratory sciences field is 13 percent, said Dianne Cearlock, CEO of NAACLS. In the next five years, 13 percent of the workforce is expected to retire, with 25 percent of the workforce retiring over the next 10 years" (Ernado, 2009). According to the American Society for Clinical Pathology, the outlook is even worse. They predict that 40% of the workforce in clinical laboratories will need to be replaced in the next 10 years (Hilborne, 2008).

This shortage is projected to become even worse as the professionals of the "baby boomer" generation retire. According to the American Society for Clinical Laboratory Science,

> [A] concern is the aging laboratory work force, reflecting the fact that the pace at which younger newly trained professionals are entering the laboratory workforce is not keeping up with retirements. Approximately 40 percent of the laboratory workforce is within ten years of retirement. (American Society for Clinical Laboratory Science [ASCLS], 2008)

More professionals need to be educated in all health care professions, including the clinical laboratory (ASCLS, 2008; Coordinating Council on the Clinical Laboratory Workforce, 2009).

Neither mentoring nor formal education on how to conduct clinical instruction is provided to clinical instructors in most allied health professions (Rogers, Dunn, & Lautar, 2008, Giordano, 2008). Medical laboratory science is no exception. Accreditation standards for MLS programs do require the curricula to include "Education techniques and terminology sufficient to train/educate users and providers of laboratory services" (NAACLS, 2011, np). However, the extent of introduction to education varies greatly from one MLS program to another and may consist of only an hour or two of instruction on education. In addition, many current clinical instructors graduated before this educational component was required. Also, some clinical instructors are not graduates of accredited programs as there is no licensure in the states used in

this research and federal regulations only stipulate that laboratories hire personnel with "appropriate" education and training as determined by the laboratory director. Some hospitals also use medical laboratory technicians as clinical instructors; their curriculum does not include anything about education. As a result, clinical instructors mostly learn to be clinical instructors in ways other than formal education.

Clinical instruction has been addressed in the literature and is detailed in chapter two. Researchers have published dissertations and other studies about clinical instructors or preceptors in such health care professions as athletic training, dietetics, nursing, and physical therapy. The literature has addressed the characteristics and behaviors of good clinical instructors, techniques of instruction by clinical instructors, and role perceptions of preceptors. Yet, research on the experiences of learning to be a clinical instructor is limited.

This research will be addressed from an adult learning framework. Adults are self-motivated, self-directed, and use life experiences as resources. Their learning needs to correspond to social role changes and other needs in their lives. Immediate application is important to adults and they need to understand why they are learning something (Merriam, 2001).

Informal and experiential learning will also inform this research. Marsick & Watkins (2001) explained that "informal and incidental learning take place wherever people have need, motivation, and opportunity for learning" (p. 28). They defined informal learning as learning which is controlled by the learner and which occurs in nonclassroom, not highly structured settings. Incidental learning, a type of informal learning, occurs as a result of some other activity and in spite of the fact that the learner is not aware of it. Tacit knowledge and situational learning and may also help explain the learning involved in clinical instruction.

A mixed methods approach was used in this research; a quantitative questionnaire was followed by an in-depth qualitative study. Wanting to explore the lived experiences of clinical instructors, interpretive research involved interviews with clinical instructors. After I obtained answers to a prescribed set of questions in the questionnaire, I sought explanations in the participants' own words in order to understand the lived experiences of clinical instructors as adult learners. The qualitative genre to be used was psychological phenomenology as described by Creswell (1998). I was looking to discover the essence of the phenomenon that is learning clinical instruction.

Statement of Purpose

The purpose of this study is to describe the lived experiences of medical laboratory science clinical instructors as adult learners in their role as instructors. This research asks, "How do medical laboratory science clinical instructors learn to conduct clinical instruction?"

Clinical instructors need to learn how to provide instruction. Through formal training and experience, they have learned to be laboratorians. Although they may be good clinicians, they are not necessarily good instructors (Henderson, Fox, Malko-Nyhan, 2006). They need to be skilled practitioners as well as effective teachers (Higgs & McAllister, 2007). This research aims to describe how MLS clinical instructors learn to teach students on the bench.

Guiding research questions

The primary research question is "How do medical laboratory science clinical instructors learn to conduct clinical instruction?"

There are three subquestions related to the primary research question, "What does a clinical instructor do to learn clinical instruction?" and "What experiences do clinical instructors

call upon to help them in learning to be clinical instructors?" and "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?"

Delimitations

Out of dozens of allied health careers, only one is represented in this research. The descriptions developed from this research only apply to the sites and people involved. This is expected because qualitative research is not generalizable to larger populations.

Only participants in sites affiliated with baccalaureate level programs were considered in this research. The depth of knowledge and critical thinking expected of baccalaureate programs may entail different teaching strategies than those used for associate degree programs (such as medical laboratory technician (MLT) programs). Different teaching strategies and techniques may involve different learning by the instructors, therefore, clinical instructors who solely teach students from associate degree programs were not used. Some of the clinical instructors did teach students from both baccalaureate and associate-degree programs.

Hospital-based laboratory programs were excluded from this research because of the different nature of teaching in these programs. The professionals at such hospital sites are usually involved with teaching the student both the cognitive background knowledge as well as the clinical rotations, often simultaneously. They may be involved with lecturing as well as bench instruction. In this role they may have more motivation to learn how to teach, and they may have developed different mechanisms to learn how to teach than if they were just doing bench instruction. Also, in hospital-based programs, the students spend the entire time at the hospital which may lead to different relationships with the instructors than the university programs which only send the students to the sites for a few weeks at a time. This results in these professionals

potentially having a quite different experience teaching than those who are assigned to teach students from a university program.

Participants were selected from baccalaureate programs in the Midwest. Clinical instructors are employed by the clinical (laboratory) facility. Although they may or may not have adjunct faculty appointments, they are not faculty members paid in full or in part by the university programs. It was not the intent of this research to examine the learning of instruction of academic faculty members.

Definition of terms

For the purposes of this research, the following terms will be defined as follows:

Academic coordinator - college faculty member who communicates with clinical, usually hospital, sites regarding scheduling of student rotations.

Adult education - "a process whereby persons whose major social roles are characteristic of adult status undertake systematic and sustained learning activities for the purpose of bringing about changes in knowledge, attitudes, values, or skills." (Merriam, 1997)

Adult learning – learning that occurs by assumptions or mechanisms identified as "adult" by Malcolm Knowles and subsequent adult education "theorists." (Knowles, 1980)

Affiliate – a hospital laboratory to which a university program sends medical laboratory science students for their clinical rotations. A student may rotate through all departments at the same affiliate or may go to multiple affiliates.

Allied health – all health care professions excluding medicine and nursing. The definition used by the Association of Schools of Allied Health Professions is

> Allied Health professionals are involved with the delivery of health or related services pertaining to the identification, evaluation and prevention of diseases

and disorders; dietary and nutrition services; rehabilitation and health systems management, among others. Allied health professionals, to name a few, include dental hygienists, diagnostic medical sonographers, dietitians, medical technologists, occupational therapists, physical therapists, radiographers, respiratory therapists, and speech language pathologists (Association of Schools of Allied Health Professions, 2008).

Bench – work station in a medical laboratory to which a laboratorian is assigned to work or a student is assigned to learn. This involves a discrete type of work and knowledge. Examples are the respiratory culture bench in microbiology or the automated instrument bench in hematology. In many laboratories, laboratorians work a variety of benches within one department but usually only one bench each day.

Bench instruction – same as "clinical instruction" below, used to differentiate this "on the job" instruction from didactic or lecture learning situations.

Clinical instructor - a professional employed by a medical facility who is assigned to instruct one or two students during a clinical rotation at a clinical site, a person assigned to directly teach, supervise, and evaluate student performance in the clinical (hospital) setting.

Clinical instruction - the process of teaching, supervising, modeling, and evaluating student performance during a clinical rotation/field experience

Clinical rotation - a period of time spent in a medical department learning the job of a professional, incorporating knowledge and skills learned in campus courses and student laboratories, and learning professional behaviors and attitudes. The word "internship" is not used in this study because "internship" implies a paid position of an on-the-job training that follows a

planned course of study such as medical school. In allied health programs, the clinical rotations are an integral part of the course of study, not just on-the job training.

Cognitive - didactic, related to theory knowledge, as opposed to psychomotor skills and attitudes

Coordinator/Facilitator – person employed by the medical facility who acts as the liaison between the medical facility and the university. This person usually scheduled the student rotations and collects assessment data and reports the data back to the university. They may also be a clinical instructor.

Department - a subdivision of the medical laboratory. The four main departments/disciplines in a medical laboratory are microbiology, chemistry, immunohematology (blood bank), and hematology. A laboratory student rotates through these sequentially.

Faculty - an employee of a college or university program, responsible for campus courses in one or more disciplines. Each is responsible for the majority of the cognitive knowledge in the program and student laboratory experiences. Often each is also responsible for the clinical rotations in the same discipline(s).

Field experience - a period of time spent in the clinical setting or on the job by students as part of an educational program, sometimes called a clinical rotation.

Formal education - planned course or program offered by an educational institution.

Informal learning - lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment - at home, at work, at play (Coombs and Ahmed, 1974)

Laboratorians - medical laboratory professionals, including supervisors, medical laboratory scientists/medical technologists, and medical laboratory technicians are included for this study.

Laboratory - medical diagnostic laboratory usually housed in a hospital, where patient samples are run for diagnostic, prognostic, and health-assessment purposes.

Lived experience – identifiable learning events, identified at the time or later as learning events, expressed in the participant's own words. These events may be cognitive or affective learning experienced through formal, nonformal, or informal learning.

Medical laboratory science – an allied health profession in which members perform medical laboratory tests for the purpose of assessment of health and diagnosis of disease. Also known as medical technology or clinical laboratory science. Abbreviated MLS.

Medical laboratory scientist – a baccalaureate-level allied health professional who performs medical laboratory tests, supervises, and/or does research. Also known as a medical technologist or clinical laboratory scientist.

Medical laboratory technician –an associate-degree level allied health professional who performs medical laboratory tests and works with medical laboratory scientists; abbreviated MLT.

Nonformal education - is any organized, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning (Coombs and Ahmed, 1974).

Preceptor - a skilled practitioner who supervises students in a clinical setting to allow practical experience and training with patients. Synonymous with "clinical instructor" as used in this study except that this study does not include preceptors/instructors who are employed by the health care program/educational institution. Sometimes preceptor is used to describe the person who mentors a new employee (Henderson, Fox, Malko-Nyhan, 2006). This is not the sense in which it is used in this dissertation.

Program - a structured course of study, such as a medical laboratory science program at a college or university which leads to a bachelor's degree and/or a certificate as well as eligibility for a national certification examination.

Procedure – a unit of work performed by a professional or student such as a laboratory test.

Reflection – the process of intentionally considering something, more than bringing to mind.

Rotation – see Clinical rotation.

Supervisor - person who supervises one of the areas in the clinical departments of the laboratory such as clinical chemistry, hematology, immunohematology (blood banking), and microbiology; may or may not be a clinical instructor

Tacit knowledge – "personal knowledge embedded in individual experience and involves intangible factors" (Nonaka, 1995, p. 23). It is difficult to verbalize or recall how it was obtained.

Significance of the study

This research will add to the body of knowledge of adult education regarding informal learning and experiential knowledge in the context of medical laboratory science education. Understanding this experience from the instructor's point of view will also result in an appreciation by university program administrators and hospital administrators of what is involved with professionals learning to conduct clinical instruction.

Our health care is in the hands of the professionals that clinical instructors have instructed in the allied health programs. Although the role of the clinical instructor is essential in the professional education of allied health students, these instructors usually have no formal educational training. Knowing how these clinical instructors learn to conduct clinical instruction will help identify experiences that enhance their development. Hospitals, university programs, and/or professional organizations can then use this knowledge to help clinical instructors.

Perhaps some of these experiences can be formalized to enhance learning of clinical instruction. Perhaps a way to accelerate the process of learning of instruction can be developed from this research.

In a larger sense, this research will add to the body of knowledge in learning in general because it covers a novel population, clinical instructors. The integrated mixed methods research design can serve as a model for future research. As LeCompte (2009) said, "Teaching and learning are complex, highly diverse, and frequently individualistic phenomena. That complexity poses a major dilemma in educational research: Since educational phenomena typically are poorly understood, investigating them requires insights from multiple disciplines using multiple kinds of research designs" (p. 25).

Organization of the study

In this dissertation, Chapter 1 gives the background for the research and the questions to be addressed. Chapter 2 reviews the literature of clinical instruction and adult learning. The research design is detailed in Chapter 3. Chapter 4 will include the findings of the research, including discussion of the data. Chapter 5 will answer the research question and subquestions in light of the literature. References will be followed by the appendices.

Chapter 2

Review of Related Literature

Clinical instructors play a vital role in the education of allied health students. Clinical instructors are gatekeepers of the professions in the sense that students must get satisfactory evaluations from the clinical instructors before they can graduate and take state or national certification or licensure examinations (American Society for Clinical Pathology [ASCP], 2009; Board of Certification, 2009). After taking lecture and laboratory courses at the educational institution, students in an allied health profession such as medical laboratory science then rotate through clinical/hospital placements to integrate their academic knowledge with professional skills and attitudes. At the clinical sites students are assigned to clinical instructors who supervise the students' education and practice in the real clinical setting.

The clinical instructors, as defined in this research, are responsible for patient results as well as instruction of students. After the students have been in controlled campus laboratories, these instructors are expected to guide the students through a learning process until they develop entry-level competence in the complex situations encountered in clinical practice. According to Rogers, Dunn, & Lautar (2008), "This requires a broad-based appreciation of alternative teaching strategies, knowledge of methods by which performance can be evaluated, and skills in designing remedial activities for students who are having difficulty performing" (p. 41). Clinical instructors help the students learn not just practical skills but also professional behaviors. They also help the students integrate didactic knowledge learned at the university with clinical practice and decision-making.

Clinical instructors have had little or no formal education in how to conduct clinical instruction; they must learn how to conduct clinical instruction through other means (Guiles &

Ward-Cook, 2006; Susi, 2010). Clinical instruction is especially difficult because of their heavy workloads. In this era of health care personnel shortages and economic cut backs (Department of Labor, 2008), clinical instructors in medical laboratory science have little time for instruction much less time for activities to help them learn or improve their clinical instruction. Other professions are also short-handed and overworked. In 1999, Clay said that "community preceptors frequently have little time that is not scheduled for clinical service" (p. 406). They have even less time today than in 1999.

Little research exists about clinical instruction. According to Sheets (2008), "Clinical teaching is a complicated undertaking. It is so complex that few researchers have tackled the issues that need to be addressed….Most research is based on clinical-instructor effectiveness" (p. 7). As Giles, Wetherbee, and Johnson (2003) said, "Clinical instructors assume an influential role in the professional and social development of physical therapy students. Despite this important role, there is a paucity of published literature describing the qualifications and credentials of these individuals" (p. 50).

Although very little research has been published on clinical instruction in medical laboratory science, the literature in other health care professions and literature in adult education provide foundations for this research. Clinical instructors in all disciplines are strongly motivated to improve their clinical instruction (Rogers, Dunn, & Lautar, 2008; Susi, 2010). Literature discussing experiential and situated learning, tacit knowledge and informal learning also informed this research. These theories are interrelated and as these theories are fleshed out through research, they become more and more difficult to categorize. In the introduction to his book, Tight (2002) mentioned that he had difficulty in organizing the second edition of *Key Concepts in Adult Education and Training* because of the interrelatedness of the concepts.

Researchers have published quite a few dissertations and other studies about clinical instructors or preceptors in athletic training (Craig, 2002; Dondanville, 2005; Pircher, 2008; Wright, 2009; Susi, 2010), nursing (Blazey, 1995; Parsons, 2006; Schultz, 2004; Sheets, 2008; Totin Meyer, 2002), and physical therapy (Buccieri, Schultze, Dungey, Kolodziej, Marocco, Michaels, & Stolove, 2006; Giles, Wetherbee, & Johnson, 2003; Higgs & McAllister, 2007; Jarski, Kulig, & Olson, 1989; Kelly, 2008). Some literature has been published in other health care professions also, such as pharmacy (Dehoney, 1999), dietetics (Gould, 2007; Hasseberg, 2003; Wilson, 1999), occupational therapy (Hooper, 2007), ultrasound (Edwards, 2006), and dental hygiene (Romberg & Metzger, 1984).

Abundant literature addresses the traits of good clinical instructors (Bain, 1996; Buccieri et al., 2006; Laurent & Weidner, 2001) and behaviors of good clinical instructors (Dondanville, 2005; Dunlevy & Wolf, 1992; Jarski, Kulig, & Olson, 1990; Kelly, 2007; McCown, 2004; Neville & French, 1991; Öhlring & Hallberg, 2000, 2001; Romberg & Metzger, 1984; Schultz, 2002; Schultz, 2004; Wetherbee, Nordrum & Giles, 2008). Techniques of instruction used by good clinical instructors are also covered in the literature (Baltimore, 2004; Beck & Stritter, 1988; Edwards, 2006; Page & Ross, 2004; Totin Meyer, 2002). Also role perceptions of preceptors are discussed by several researchers including Higgs (1992) and Wilson (1999). Yet, health care research on the experiences of professionals learning to be clinical instructors is limited (Yonge et al, 2003).

Some caution must be used in the application of research of other health care professions to the profession of medical laboratory science. Terminology is one concern as a variety of terms are used to describe what the current research calls “clinical instruction.” Clinical supervision, preceptorship, mentorship, and clinical education are mentioned as key words in a literature

search done by Lynch, Happell, & Sharrock (2008) as they researched the literature for articles about mentorship and development of new health care employees. They noted that "much of the literature is health discipline specific and authors tend to discuss clinical supervision as an entity in their own profession with little if any acknowledgement of the parallel work of other disciplines" (2008, n.p.). They summarize the literature of America, Britain and Europe.

Rose and Best (2005) listed a plethora of synonyms for the role that they end up calling clinical educator or clinical supervisor. From an exploration of the literature in health care professions in Australia, the United Kingdom, the United States, and Canada, they list "coach, clinical teacher, clinical educator, clinical supervisor, field supervisor, preceptor, mentor, professional supervisor, supervisor-mentor, and collaborative peer supervisor" (p. 2). For their own purposes they defined clinical education as "the practice of assisting a student to acquire the required knowledge, skills and attitudes in practice settings (such as health service clinics, field work sites) to meet the standards defined by a university degree structure or professional accrediting/licensing board" (p. 3). A clinical educator, then, is the person who engages in this practice of clinical education.

These terms, however, are not synonymous in all cases. In nursing, for example, the term 'preceptor' refers to a hospital employee who provides clinical instruction for nursing students as described in this research (Billay & Yonge, 2004; Clay, Lilley, Borre, & Harris, 1999; Ferguson, 1994; Ferris, 1988; Lafloret-Fliesser, Ward-Griffin, & Beynon, 1999; Nehls, Rather, & Guyette, 1997; Öhlring & Hallberg, 2000; Yonge, Krohn, Trojan, Reid, & Haase, 2002). However, 'preceptor' can also refer to a hospital employee who is responsible for orienting a new nurse employee to the job (Bain, 1996; Baltimore, 2004; Scanlon, 2001). Although some aspects of being a preceptor would be the same for both of these types of preceptors, some experiences

would undoubtedly be different. For example, for both students and employees, preceptors would need to assess skills and behaviors. On the other hand, preceptors of new employees do not need to teach cognitive, psychomotor, or affective behaviors at the same level as for a student and thus may need different skills as a preceptor. For students, they need to start from scratch in some situations. For employees, they can skip the basics and go straight to demonstrating some advanced tips for practice and how to do the paperwork at that place of employment.

Another difference between nursing and some allied health professions such as radiography and medical laboratory science is the term “clinical educator.” A clinical educator, sometimes also called “clinical instructor” in nursing and radiography, is an employee of the academic institution, a faculty member of the program, who goes into the clinical setting and teaches students there. University-based medical laboratory science programs do not use such a model. The only teachers of students at the medical laboratory science clinical sites are clinical instructors who are employees of the clinical site/hospital.

Difficulty in the interpretation of reported experiences of other health care professions arises because of the inherent differences between other professions and the profession of medical laboratory science. Teaching of patients occurs in most of the care-giving health care professions such as nursing and physical therapy; whereas, this is not true of medical laboratory scientists who work in the laboratory with specimens such as blood. A component of many other professions is instructing and relating to patients. The experience of learning how to conduct clinical instruction may be different for MLS because they have to learn more of the relational aspects of clinical instruction.

Thinking and learning styles may also be different for people practicing different professions. Personality also impacts how a person learns (Long, 2004). Using the Harrison and

Bramson thinking styles questionnaire, Schwabbauer et. al. (1985) found that clinical laboratory scientists think differently than nurses. According to Schwabbauer, clinical laboratory scientists have "rather sizeable differences [from nurses] on every subtest but the 'pragmatist' " (1985, p. 520). Although these authors found an overall difference in thinking styles, there are undoubtedly large overlaps of different types of thinking styles in each health care profession. Although literature from other professions can be used to inform the research about medical laboratory science, care must be taken to interpret the research in light of potential differences in terminology and practice. Literature from other professions will be considered in this research but care will be taken in its application to the phenomenon of medical laboratory science clinical instructors learning to conduct clinical instruction.

Clinical instructors

Publications on the traits of clinical instructors, the behaviors or methods used by clinical instructors, and the role perceptions of clinical instructors have been listed in the previous section. For example Blazey (1995), Dehoney (1999), and Schultz (2002) discussed what pharmacy clinical instructors do in their teaching roles and Wilson (1999) discussed the roles of dietetic clinical instructors. Kelly (2007) discussed what makes an exemplary clinical instructor in physical therapy and Hasseberg (2003) discussed what dietetic preceptors need to perform their role as clinical instructors.

More pertinent to this research is the abundant literature that clinical instructors in all health care professions are underprepared to conduct clinical instruction. Jarski, Kulig, and Olson (1990) found that physical therapy clinical instructors recognize their need to learn more about how to teach. The preparation of nursing preceptors was identified as a topic for further research by Billay &Yonge (2004), Beck & LeGrys (1988), Ferguson (1994), Ferris (1988),

Paton (2007), and Rogers, Dunn, & Lautar (2008). In their dissertations, Schultz (2004) and Kelly (2008) also discussed the need for nursing preceptors to have ongoing development. Underprepared clinical instructors were discussed by Buccieri et al (2006) regarding physical therapy. The problem of underprepared clinical instructors in athletic training was discussed by Giordano (2008), Pircher (2008), Susi (2010), and Weidner & August (1997).

At least two health care professions, medical laboratory science and physical therapy, require the academic institutions to graduate entry-level professionals who are ready to do some instruction. In physical therapy, the accrediting agency expects graduates to be able to do clinical instruction of students. In MLS, the National Accrediting Agency for Clinical Laboratory Sciences requires graduates to have competency in educational techniques sufficient to educate other health professionals and the public (NAACLS, 2011). Whether graduates have achieved any competencies related to clinical instruction will be discussed in this research.

Professionals who graduated since these standards were adopted, however, do not necessarily know how to be clinical instructors. In MLS, the standard does not address the education of students but education of health care workers and the public. In physical therapy, Wetherbee, Nordrum, and Giles (2008) said that "it is unclear how comprehensively academic institutions prepare students to be clinical instructors" (p. 66). Teaching patients is part of the job of physical therapists, but "it is unknown whether this inherent capability provides a clinical instructor with enough skill to be effective in training future professionals" (Wetherbee, Nordrum, Giles, 2008, p. 66). They concluded that clinical instructors lack the kind of training to prepare them to be effective clinical instructors.

Dunlevy and Wolf (1992) found many inconsistencies between the importance of clinical teaching behaviors and the frequency with which they were actually practiced. They also found

inconsistencies between effective teaching behaviors that the clinical instructors said they used and the effective teaching behaviors that students reported that the instructors actually used. They suggested that an undergraduate unit on effective clinical education should be included in undergraduate programs because many graduates become clinical instructors soon after graduation. They also recommended using only those clinical instructors who possess effective teaching behaviors and providing 'instructional opportunities' for clinical instructors' development.

Rogers, Dunn, and Lautar (2008) also concluded that professional training does not prepare professionals to be clinical instructors. They mentioned that "success in the role of clinical supervisor requires attention to aspects of teaching that most likely were not included in the preceptor's professional training" (2008, p. 41). They suggested that clinical supervisors/preceptors need a workshop and web site support.

At least two health care professions, physical therapy and athletic training, have instituted voluntary credentialing of clinical instructors. Wilson (2002) described how the American Physical Therapy Association began the voluntary Clinical Instructor Education and Credentialing Program in 1996 to give clinical instructors some recognition. Since then, both new clinical instructors and those who have had experience doing clinical instruction have taken the program. It was suggested that clinical instructors may even get more out of the program if they have taught at least a few students. The 15-hour program covers such topics as how to organize a clinical program, assessing readiness to learn, how to create boundaries, personalizing instruction, conflict resolution, and evaluation.

Wojceichowski (2007) announced plans for a two-day Advanced Clinical Instructor Credentialing Program in response to demand from the 15,000 already-credentialed clinical

instructors. This shows an ongoing interest and motivation in developing as clinical instructors. The program is also intended to incorporate more advanced physical therapy practice associated with the profession's move to the Doctor of Physical Therapy as the entry level for clinical practice. An Advanced Clinical Instructor Education and Credentialing Program is now active (APTA, n.d.).

In 1999, Walters announced that a two-day Clinical Instructor Educators course was going to be offered to 'teach the teachers' of athletic training. The stated purpose was to improve the quality of instruction. Once athletic trainers complete the course, they are to return to their institution and put on workshops for the other clinical instructors. In 2004, Weidner and Henning (2005) developed standards for the selection, training, and evaluation of clinical instructors in athletic training. These standards address ethical behavior, communication skills, professional interpersonal relationships, instructional skills, supervisory skills, evaluation, and clinical skills and knowledge.

However, research has not shown that outcomes are better if clinical instructors are credentialed. Using the Physical Therapist Clinical Performance Instrument, Housel & Gandy (2008) did not find a significant difference in ratings of students working with APTA-credentialed clinical instructors and those working with noncredentialed clinical instructors. Post hoc analysis, however, did show that students working with a credentialed clinical instructor showed greater improvement over time, but they also started out with lower ratings.

Wetherbee, Nordrum, Giles (2008) found that there was no significant difference in teacher effectiveness between accredited and nonaccredited physical therapy clinical instructors for the overall score or any domain (clinical instructor ability, interpersonal relationships, personality traits, physical therapy competence, evaluation). "Although clinical faculty may

express enthusiasm for these learning opportunities, and participants report greater confidence in their teaching skills after participating in them, factors such as heavy workloads have been noted to interfere with clinical instructors' ability to effectively implement some of the teaching strategies in the courses" (p.66). They did, however, find a correlation between years of clinical teaching experience and the effectiveness scores. So the clinical instructors may be learning to be better clinical instructors as they teach. This will be examined in this dissertation.

Using the Survey of Effective Clinical Educator Behaviors, Wright investigated the relationship between the preparation of clinical instructors in athletic training who had formal pedagogical education or were credentialed clinical instructors and quality of clinical education experiences (2009). There were few correlations. Credentialed clinical instructors felt that training for credentialing as an approved clinical instructor was most important to their success compared to formal teaching certification, courses or workshops in pedagogy, and other methods.

Besides these examples of credentialing programs, many health care courses or guides have been developed to help clinical instructors. Beck & LeGrys (1988) wrote *Clinical Education* as a course for medical laboratory science/medical technology students but also as a reference for clinical instructors. Eraut (1994) and Shea (1985a) discussed courses for multidisciplinary use. Many guides for nursing clinical instructors/preceptors have been written (Bell-Scriber & Morton, 2009; Clay et al, 1999; Ferris, 1988; Kaviani & Stillwell, 2000; O'Connor, 2001). Wojciechowski (2007) discussed a course for physical therapy. Vanguiri & Konin (2008) and Walters (1999) described courses for athletic training clinical instructors. As a result of the health care shortages and economic cutbacks, the time crunch of preceptors described by Clay, Lilley, Borre, & Harris (1999) is even worse today, over ten years later. Clay

et al. (1999) called for development programs for preceptors. They encouraged sponsors of such programs to make these well designed and well delivered because of the preceptors' lack of time.

The process of learning to be a clinical instructor is specifically addressed in a few articles. In her qualitative study comparing novice and expert clinical teachers, Scanlan (2001) found that clinical instructors in nursing learn clinical instruction through six activities, including their experiences as students, nurses, and clinical instructors. They learned from other clinical instructors and through feedback during the instructional processes. Unable to articulate some of the learning process, participants called the intangible processes "intuition," "magic," and "osmosis." Novices did not make a direct link between clinical instruction and reflection because they were preoccupied with the current teaching situation.

Continuing education is mentioned in much of the literature as a means of learning clinical instruction. Several authors have written about what types of continuing education are used by clinical instructors or practitioners who may or may not be instructors. Summers, Blau, & Ward-Cook (2000) surveyed the use of the following by clinical laboratory scientists: audiotape, workshop/seminars, in-service, case study, teleconference, distance learning, journals, college courses, correspondence courses. They also found that two of the factors affecting professional development include organizational funding of continuing education and supervisors maintaining supportive environment and stimulating work. Poor funding or poor support for learning result in less development of the professionals, potentially also affecting their development as instructors.

Wetherbee (2008) stated that it is unknown what motivates physical therapy clinical instructors to participate in the national clinical instructor credentialing program. Perhaps adult learning theory can provide some answers.

Adult learning

Adult learning is a large and important component of adult education and it provides the main framework for this research. A unique body of knowledge has developed over the past 50 years and continues to develop and expand and integrate with many theories of learning. For this research, adult learning is defined as learning that occurs by assumptions or mechanisms identified as "adult" by Malcolm Knowles and subsequent adult education theorists (Knowles, 1980).

Andragogy, a popular adult learning theory or perspective, was originally defined by Knowles (1980) as "the art and science of teaching adults" (p. 43). Andragogy is a term that Knowles borrowed from the Europeans, having been introduced to the concept by Dusan Savicevic (Cooper & Henschke, 2002). At first Knowles differentiated andragogy, which comes from the Greek for "man" (not child), from pedagogy, which comes from the Greek for "child." At the time, studies were showing that adults learn differently than children. Later, Knowles came to see andragogy as situational:

> Some pedagogical assumptions are realistic for adults in some situations and some andragogical assumptions are realistic for children in some situations. And I am certainly not saying that pedagogy is bad and andragogy is good; each is appropriate given the relevant assumptions. (1980, p. 53)

In *The Modern Practice of Adult Education: From Pedagogy to Andragogy*, Knowles (1980) explained that he had come to see pedagogy and andragogy as two ends of a spectrum.

From his own extensive experience with adult learners, Knowles (1980, 1995) articulated six assumptions about adult learners which include (a) the need to know, (b) the learner's self-

concept, (c) the role of the learner's experiences, (d) readiness to learn, (e) orientation to learning, and (f) motivation.

Adults need to know why they need to learn something before undertaking to learn it. Adults want to know how, what, and why learning will take place and want to be involved in these decisions. They come with individual needs and purposes.

Adults have self-concepts of being responsible for their own lives (Knowles, Holton, & Swanson, 2005). They are not dependent on the teacher like children are (Knowles, 1980, 1995). They are self-directed, making their own decisions about their learning. The amount of self-directedness, however, should be congruent with the individual's readiness for self-direction. If there is not enough self-direction (too prescribed), the learner will be frustrated. If there is too much self-direction, the learner will be intimidated and lost (Vodde, 2010).

Adults come with experience to learning situations (Knowles, 1980, 1995). This experience may allow different adults to begin at different points in learning the same thing. Experience also frames new learning, allowing an adult to put new learning into perspective in relation to other knowledge that they possess. Experiences of one adult can also serve as resources for the learning of other adults. Past learning could also potentially be a barrier to learning if an adult cannot get past a fixed or preconceived idea.

Adults come to a learning situation ready to learn when they have a need to learn something. They are ready to learn when the learning will help them cope with life, especially moving from one developmental stage of life to another (Knowles, Holton, & Swanson, 2005).

Adults are life-centered in their orientation to learning, as opposed to the subject-centered orientation of children (Knowles, 1995). They are ready to learn when what they are learning

will help them solve an immediate problem in their lives. They maintain interest as long as the learning applies to real life situations, such as helping them to do something better.

Internal motivation to learn is the primary motivation for adults. Although some external motivators such as a chance for promotion or the need to learn because of new technology will motivate adults, internal motivators such as self-esteem and personal growth play a more important role in motivating adults to learn (Knowles, 1995). Cooper and Henschke (2002) summarize the assumptions about adult learners:

> They are self-directed, their experience is a learning resource, their learning needs are focused on their social roles, their time perspective is one of immediate application, they are intrinsically motivated, they want to problem-solve, and they want to know why they need to know something. (p. 5)

Knowles (1980, 1995) proposed how to plan, operate, and evaluate adult learning using these assumptions. For example, adults should be involved with planning, conducting, and evaluating their own learning experiences.

Critics point out that much of the writing of Knowles was descriptive and lacking in theoretical foundation. Davenport (1987) reported that empirical testing of some of Knowles' assumptions has not always supported the assumptions. Rachal (2002) discussed the controversies about andragogy and critiques empirical research, showing that the research is almost impossible to compare because of variations in definitions and assumptions. For example, often the learners in the studies did not truly have input into the planning of the learning experience. In an attempt to encourage research on andragogy to become more focused, Rachal went on to propose seven criteria for future research in andragogy (Rachal, 2002). Tight (2002)

summarized the attacks on each of Knowles assumptions, including the question as to whether his assumptions truly apply only to adults.

In spite of this criticism, the assumptions of andragogy continue to provide a useful framework for adult education supplemented by other theories such as transformative learning. Even Tight (2002) concluded that andragogy "retains some value as a guide to practice" (p. 114). Research on andragogy, including empirical studies, continues to be done, especially in doctoral dissertations. For example, a search of ProQuest Dissertations shows that just in 2010 at least sixteen dissertations included 'andragogy' in the abstract and over 600 dissertations mentioned andragogy (ProQuest, 2010). In one of these dissertations, Bradley (2010) found that andragogical learning methods were equally effective as pedagogical methods in teaching online grant-writing; however, the participants who used the andragogical module had higher overall learner satisfaction. Hinkson (2010) created the Adult Learning Instructional Practices Survey (ALIPS) in order to study community college graduates' perceptions of adult learning instructional practices used in continuing education programs. She found the factor that explained the most amount of variance was her Instructional Expectations factor which aligned with Knowle's "need to know" assumption of adult learners. Johnson (2010) coined the term "appreciative andragogy" and developed it as an instructional strategy. Meyer (2010) found that the Experiential Learning Model used by Army Reserve Instructors adheres to some concepts of adult learning theory, such as "development of an environment in which the learners feel a need to learn by being exposed to new possibilities for self-fulfillment" (p. 62). Vodde (2010) found that assumptions about adult learners apply to police recruits and that androgogical methods were more effective than pedagogical methods in training police recruits. Vodde also explains that learning is not the central focus of an adult life, "Notwithstanding that learning is an

important component of an adult learner's life…it is not their primary concern in life" (2010, p. 103). Learning clinical instruction is neither a clinical instructor's main focus on the job nor a focus of his/her life.

Tough (1979) described how and why adults self-plan their learning. In order to learn, the adult must seek help because the learning situation is usually not a formal educational setting. Tough said, "The help-seeking process is not always rational and straightforward….Often the learner receives unanticipated help from some source" (p. 99). Tough's sentinel work, based on the work of Houle, was the beginning of self-directed learning.

Self-directed learning (SDL) can be part of a number of perspectives or philosophical positions, including andragogy (Knowles, 1980), transformative learning (Mezirow, 1991; Brookfield, 1992), and emancipatory learning (Brookfield, 1992). Even the models that Merriam, Caffarella, & Baumgartner listed under SDL "represent a mixture of conceptual, empirical, and experientially derived views of the process of self-directed learning" (2007, p. 110). Brookfield (1992) also spoke about the spectrum of individual perspectives in self-directed learning:

> Some adults are self-directed, or critical, and others aren't. Or that some children are self-directed, and others aren't. Or, even more accurately, that the same children and adults can be self-directed, or critical, in some contexts but shy away from taking control or challenging authority in others (p. 14).

Self-directed learning research mostly focuses on the individual, especially in relation to autonomy and lifelong learning. Lifelong learning is a concept that is more formalized overseas. In the United States, most educators and professional organizations call for all individuals to be intentional lifelong learners; however, there is rarely a systematic plan for such learning. Professions may require continuing professional education, for example, but they have no

prescribed way of doing it. Because individuals vary so much in interest, motivation, and learning styles, it is probably good to allow them to use a variety of ways to continue learning. On the other hand, there may be a lack of opportunities for learning if no one has thought about it systematically. Clinical instructors are not required to have any education or training, although individual programs may have their own local courses (Bell-Scriber & Morton, 2009; Ferris, 1988; Kaviani & Stillwell, 2000; Shea, 1985a; Vanguri & Konin, 2008). There was discussion of the need for training programs for clinical instructors in clinical laboratory science on the educators' listserv in 2009 (CLS Educators' Listserv, June 26-July 6, 2009, personal communication). Several people responded that they were already using such programs, sometimes using materials on the Internet or materials designed for nursing programs at their institution. Self-directed learning can include such formal programs as well as informal and individual learning activities.

Because there is no endpoint where a person is considered to be an expert instructor, learning to be a good instructor is an ongoing and lifelong process. Rogers, Dunn & Lauter (2008) describe the types of educational expertise needed by clinical instructors:

> In allied health curriculums, the clinical education component requires supervisors to promote the students' ability to synthesize and apply their professions' knowledge to different and often complex clinical circumstances. To achieve these objectives, clinical supervisors are expected to develop individualized learning experiences for the students who come to the clinical component of the curriculum with a wide range of abilities and backgrounds. This requires a broad-based appreciation of alternative teaching strategies, knowledge of methods by which performance can be evaluated, and skills in designing remedial activities for students who are having difficulty performing. (p. 41)

In her article about a transformative approach to improving teaching, Hooper (2007) listed activities that can potentially help occupational therapy faculty development. They include, "reading about differing views of teaching and learning, discussing critical incidents in the classroom, watching each other teach, [and] discussing one's responses to student evaluations" (p. 204). She also suggests that an educator might "try a different approach to teaching, to designing assignments, to grading, to interacting with students, and then talk about the experience with colleagues. Case studies of teaching can also be useful" (p. 205).

According to Knowles (1973, 1980) and Caffarella (2002) adult learning is characterized by self-direction, self-motivation, and self-discovery. Adults like to watch others and use role models and mentors. They learn best with active involvement and would rather discuss a subject than listen to a lecture. Repetition is helpful for adult learning. The subject matter must meet some need of the adult to be learned and should be immediately applicable. Adults need to learn in a psychologically safe place and not be afraid of being embarrassed. Clay et al. (1999) added that adults prefer to learn in a community of learners and like frequent positive feedback.

Transformative or transformational learning theory was first described by Mezirow (1991, 2000). Mezirow's transformative theory states that individuals make learning by processing information through their own set of opinions, history, psyche and point of view. Transformative learning occurs when something changes or transforms in this set; it changes the way a person thinks about themselves and the world. As Sheets describes it, "Transformative learning involves changing one's frame of mind or meaning perspectives to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so they produce beliefs and opinions to guide one's actions with greater precision and justification" (2008, p. 44).

Daloz's research on mentoring informed the transformative learning literature and the learning of clinical instructors. One of many roles for clinical instructors is mentor (Rose & Best, 2005). Daloz said that dialog or story-telling between the mentor and learner fosters the process of growth or transformation, in the learner. He called the mentor "a trusted guide rather than a tour director" (1999, p. xi). He also discussed the possibility that a person's development as an adult can influence the behaviors of mentors. Development as an adult or development as an instructor may not necessarily correlate with advancing age. In fact, Orton (2007) reported that "Effective clinical teachers' scores did not correlate with the predictor variables: years teaching nursing, number of educational courses completed, years teaching courses other than nursing, and biological age" (p. x).

Adult learning as applied to clinical instruction is addressed in health care literature mostly in nursing (Baltimore, 2004; Clay et al., 1999; Elisha, 2008; Ferris, 1988; Totin, 2002). A multidisciplinary study, Dunlevy and Wolf (1992), mentioned andragogy as an important impetus for good clinical teaching but not as a basis for learning by the clinical instructors. Besides the mention of andragogy by Jarski, Kulig, & Olson, 1989, in a physical therapy article, there was no mention of adult learning applied to clinical instruction in allied health literature.

Totin Meyer (2002) used the Principles of Adult Learning Scale (PALS) to assess the instructional practices of nursing clinical instructors. She found that clinical instructors adhere to adult learning behaviors such as providing learner-centered activities, involving students in assessing their own needs, and allowing flexible and open discussion. They are more likely to use teacher-centered behaviors such as lack of personalizing instruction, lack of relating instruction to experience, lack of student independence, control, and participation in decision-

making, controlling time, evaluations, or identification of problems. These instructional behaviors may or may not reflect how the clinical instructors themselves act as adult learners.

However, Totin Meyer (2002) also documented participation in formal (credit) courses and continuing education courses by the clinical instructors. When asked about such courses that would prepare them to be clinical instructors, 72% said that they had not taken credit courses and 38% had not taken continuing education courses on such topics. So the majority, 62%, of clinical instructors had taken at least some continuing education courses pertaining to clinical instruction. Only 23% reported taking any kind of course specific to adult education.

Schultz (2004) also used the PALS instrument and found that full-time nursing clinical instructors used adult learning principles more than part-time instructors. The learning process is a dynamic progression and she recommended that "there should be a formalized program to teach interested, experienced nurses how to become clinical instructors" (p. 84). She recommended that the program should include instruction on the role and responsibilities of clinical faculty, teaching strategies, and adult learning principles.

Beck and Doig (2002) described the participation of clinical laboratory science practitioners (not necessarily clinical instructors) in continuing education. Only 8% reported having 2 hours or less of continuing education per year even though only half reported that continuing education was required by their employer. At the time of this study, continuing education was not mandated for continued certification by the predominant certification agency, the American Society of Clinical Pathology Board of Registry (now the Board of Certification). Now, however, continuing education is required in each major content area in which the professional practices. Continuing education in educational techniques or theory is not required but does count toward the total hours as electives. Beck and Doig found that 88% participated in

external continuing education, followed closely by in-house continuing education programs and journal articles. Twenty-five percent or less used graduate courses, graduate degree programs, Internet, or audioconferences. Out of this large sample of 600, randomly sampled from a national database, a surprising 54% had taken at least one graduate level course. Eighteen percent of these graduate courses were in education and an additional 11% took courses that combined scientific, management, and education.

Beck and Doig (2002) also surveyed clinical laboratory science educators, managers, and practitioners on what competencies are needed by clinical laboratory scientists and at what point in their career they needed those competencies: during the first year of practice, after experience but no continuing education, after experience with continuing education, or none of these. Only 6% thought that the competency "Conduct and evaluate clinical instruction and continuing education for laboratory personnel," was expected in the first year of practice. Thirty-two percent felt it was needed with experience but no continuing education. The majority, 58%, felt that this competency was expected with experience and continuing education. This confirms for medical laboratory science what research in other professions has found: that new practitioners are not ready for clinical instruction and that clinical instructors need to learn to be clinical instructors.

In researching clinical laboratory science practitioners, Guiles & Ward-Cook (2006) found that 56% frequently or sometimes used teaching skills but 41% never used any teaching skills. When asked when they learned teaching skills, the practitioners reported that 25% of them learned teaching skills first as a student, 47% said they developed teaching skills on the job, and 27% said they never learned teaching skills. There was also a significant difference using Chi-square analysis between learning teaching skills and using teaching skills. This could be because the 41% who never use teaching skills still had to learn it as students. They did not discuss how

the teaching skills were developed on the job. This will be discussed in Chapters 4 and 5 of the current research.

According to Daley (2003), knowing the career stage of the clinical instructors in research on adult learning is important. In previous research Daley found that professionals at different stages learn differently (1999). Whether they are novices, advanced beginner, competent, or proficient will help determine how autonomous they are in their teaching and learning. Novices, for example, rely on rules or instructions because they do not have experience to draw upon. Expert teachers have not only mastered their content but have learned to interact with the student and adjust their teaching as they go.

Experiential and Situated Learning

The term 'experiential learning' has been used in several different ways. A key assumption of andragogy, of course, is that adults bring experience to a learning situation. However, this is different than experiential learning as espoused by Kolb (1984) and Boud & Walker (1991). Kolb, building upon the work of Dewey, Lewin, and Piaget, proposed a theory of experiential learning that included six propositions: experiential learning is a process, relearning and refinement must occur, learners must move between reflection and action, learning is holistic, learners interact with their environment, and learning is constructed (Merriam, Caffarella, & Baumgartner, 2007). Kolb explained that his purpose was "not to pose experiential learning theory as a third alternative to behavioral and cognitive learning theories, but rather to suggest through experiential learning theory a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior" (Kolb, 1984, p. 21).

Kolb later became interested in conversation as it relates to experiential learning after discovering that learning is greatly enhanced when learners converse about their

experiences (Baker, Jensen, & Kolb, 2002). He described a theoretical framework where "learners move through the cycle of experiencing, reflecting, abstracting, and acting as they construct meaning from their experiences in conversation" (p. 52).

According to Tight (2002), Kolb's model influenced the development of the prior learning (experiential learning) movement. This movement proposes that people who obtain knowledge or skills through unrecognized means should be able to get recognition such as acceptance for eligibility to take certain courses or take credentialing examinations.

Boud and Walker (1991) discussed experiential learning taking a situated approach. Experiences occur within specific contexts or situations that affect learning. Boud and Walker also added a reflective dimension, saying that learning that occurs from reflecting on the experience is affected by the individual's own history and emotions (Merriam, Caffarella, & Baumgartner, 2007). Taylor, Marienau, and Fiddler (2000) commented that with more adults and young working people in higher education "there has been an expanding need for more experiential, more applied, and more self-reflective approaches to teaching and learning" (p. xii) and that there is a need for trainers to focus more on educating than training.

Dirkx and Lavin (1991) proposed a FOURthought model of experiential learning. The model is structured around four fundamental ways of knowing from experiences: trial and error, rationality/reflection, creative expression, and discernment. The model is described as being cyclical and holistic. The creative expression and discernment views of learning from experience focus on emotional or affective aspects of experiences.

In the allied health literature, Higgs and McAllister (2007) discussed the growth of clinical instructors in speech pathology. They explained how being a clinical educator involves growth, learning, through experiential means, "Participants in the study each related their stories

of how, through experience, self-reflection, discussion with peers and training, they had grown as clinical educators. Indeed, like other lived phenomena, being a clinical educator is a dynamic experiential phenomenon" (p. 197).

Proponents of situated learning explain that the setting and activities, the social and cultural context, shapes learning and cannot be separated from learning. Learning does not occur in an individual's mind. Lave has been the main proponent of situated cognition along with Wenger, Fenwick, and Wilson. This is "real life" learning and this concept is used to explain workplace learning and to plan such learning activities as computer instruction and cognitive apprenticeships in continuing professional education, and anchored instruction. Proponents of situated cognition maintain that learning is
social; people learn "as they interact with and within a community of practice" (Hansman & Wilson, 2002, p.1).

Hansman and Wilson (2002) argued that adult education as a field has not embraced the true concept of situated cognition. Adult educators, they say, have tried to "add on" an awareness of context or situation rather than really viewing learning from the sociocultural point of view. The situated cognition point of view also would give attention to how political and power issues affect learning. As clinical instructors function within, and learn within, a workplace with social and cultural contexts, it is possible that these contexts could affect how they learn clinical instruction.

Tacit and practical knowledge

Tacit knowledge was first described by Polanyi who developed the concept throughout his career. In *The Tacit Dimension* (1967), Polanyi described tacit knowing as "the way in which we are aware of neural processes in terms of perceived objects" (p. x), basically, "we can know

more than we can tell" (p. 4). He listed things that are known tacitly, "problems and hunches, physiognomics and skills, the use of tools, probes, and denotative language, and my list extended all the way to include the primitive knowledge of external objects perceived by our senses" (p. 29). Individuals find it difficult to verbalize tacit knowledge or recall how it was obtained.

Nonaka and Takeuchi (1995) explained that tacit knowledge is not easily visible and difficult to articulate with formal language, making it difficult to communicate. "It is personal knowledge embedded in individual experience and involves intangible factors such as personal belief, perspective, and the value system" (p. viii). Their book emphasized the importance of the interaction between implicit and explicit knowledge, this interaction "is the key dynamics of knowledge creation" (p. ix). Nonaka and Takeuchi formulated a theory of knowledge creation within a business organization, but the theory is worthy of investigation for clinical education where knowledge creation occurs within the context of a business, medicine. A major difference, however, is that the authors were applying their theory to organizational learning rather than learning of individuals. Nonaka and Takeuchi (1995) first defined "knowledge" as "justified true belief" (p.58). Then they described a spiral model which goes from the tacit knowledge of individuals to explicit knowledge of the organization through modes of socialization, externalization, combination, and internalization.

Reese (1994) found that both implicit/tacit knowledge and explicit, self-directed knowledge was involved in learning great-grandmothering. Reese said,

> It was only after reflection and dialogue that they finally could draw conclusions about [learning great-grandmothering]. Upon first being questioned, 10 out of 16 great-grandmothers stated that for them learning to

> be a great grand-mother "just happened," "came natural," "picked it up on my own," "just happens," "just came to me," or "it's intuition." (p. 276)

I expected that this would be true of learning clinical instruction also. I expected that clinical instructors learned how to teach without being able to articulate what they learned or how they learned it.

Jarvis (1992) discussed how professionals learn practical knowledge (such as doing clinical instruction). Practical knowledge has three elements according to Jarvis: knowledge that, knowledge how, and tacit knowledge. One step in acquiring tacit knowledge is forgetting. With more expertise, professionals use fewer rigid rules and more tacit knowledge (Benner, 1984). Jarvis (1992) described what he calls preconscious learning:

> Monitoring and retrospecting on action is a natural process of being consciously aware, even at a very low level of consciousness, of the total situation within which the actions are performed. The results of monitoring and retrospecting on the actions and on any slight adjustments in performance in order to adapt to specific situations are frequently internalized without conscious awareness. Hence, preconscious learning occurs through these processes of thinking about actions, which result in the development of a body of tacit knowledge within practitioners, knowledge that they would find almost impossible to articulate. (p. 93)

Baskett, Marsick, and Cervero (1992) summarized professionals' ways of learning new practical knowledge. They listed observation, guided and supported practice, modeling, coaching, and scaffolding as ways of learning practical knowledge.

In his discussion about developing professional knowledge and competence, Eraut (1994) professed that informal learning is involved in developing competence on the job, such as developing competence in clinical instruction.

> The quality of initial professional education depends to a considerable degree on the quality of practice, and that in turn is influenced by the continuing education of the practitioners. Continuing education needs to be viewed in the broadest sense of all kinds of further learning beyond initial qualification, not in the narrow sense of attending courses. Thus it includes informal learning and on-the-job learning. (p. 56)

Eraut also explained that tacit knowledge is involved in developing professional competence:

> Behind Schön's position lies the view that the term 'knowledge' should be interpreted with the broadest possible meaning. Thus it should not be confined to codified, propositional knowledge but should also include personal knowledge, tacit knowledge, process knowledge and know-how. All kinds of knowledge are necessary to professional performance. (p. 102)

He used teaching as an example of a profession that uses tacit knowledge in the continuing development of teaching skills: "Much of what a teacher does is skilled behaviour. This is largely acquired through practice with feedback….Knowledge of how to teach becomes tacit knowledge, something which is not easily explained to others or even to oneself" (p. 111).

Professionals try to make sense of challenges through reflection-in-action or "thinking on your feet." When performance has unexpected results, people tend to reflect more than if they got the same old results. This reflection can be idle speculation or an intentional attempt to

improve one's performance. Schön (1983) described practical knowledge or what he calls "knowing-in-action:"

> The workaday life of the professional depends on tacit knowing-in-action. Every competent practitioner can recognize phenomena…for which he cannot give a reasonably accurate or complete description. In his day-to-day practice he makes innumerable judgments of quality for which he cannot state adequate criteria, and he displays skills for which he cannot state the rules and procedures. Even when he makes conscious use of research-based theories and techniques, he is dependent on tacit recognitions, judgments, and skillful performances. (p. 49-50)

Schön used several sample situations which show the following occur as a result of reflection-in-action: reframing of a problematic situation, bringing past experience to bear on a unique situation, experimental hypothesis-testing, and use of virtual worlds to practice or experiment. Even science-based professions can benefit from the creativity or intuition gained through reflection-in-action, what Schön calls "seeing as" (182). The current research considered how much clinical instructors in the medical laboratory reflect upon their teaching and whether the reflection occurs in unique and challenging situations such as those described by Schön.

Summary

Research literature in medical laboratory science is limited in the area of education. Articles about teaching online or electronic media made up the single largest category of education articles in the journal *Clinical Laboratory Science* during the decade from 1999 to 2009 (CINAHL, 2009). However, there is some literature regarding education and clinical instructors in medical laboratory science. Much more literature about clinical instructors exists in

the nursing and allied health literature. This literature informed this research with careful attention to the meaning of the terms and conditions described in the literature of other professions.

The literature in health care about clinical instruction is mostly about how to conduct clinical instruction effectively. A need for clinical instructors to have more education about how to conduct clinical instruction is well documented but there is little literature about how clinical instructors go about learning clinical instruction. Even less literature specifically addresses how professionals learn to be clinical instructors in medical laboratory science. This gap was explored in this research. The abundant literature on adult learning was the foundation for this study. Literature related to experiential learning, tacit knowledge, and situated learning also informed this research.

In qualitative research such as the current study, the researcher does not really know where the research will lead. Although the researcher approached the research within a theoretical framework, the researcher needed to be familiar with a variety of potential research literature. During the research itself, the researcher continued to search the literature and learn more about the areas that arose during the data collection and analysis.

Chapter 3

Research Methods

The purpose of this study was to describe the lived experiences of clinical instructors in the allied health profession of medical laboratory science (MLS). A mixed methods design was used in this study. In order to inform the research about issues involved in learning clinical instruction, the research commenced with Phase 1, a quantitative questionnaire. Phase 2, interpretive qualitative research followed in order to inductively develop themes from descriptions of the lived experiences of clinical instructors. The goal of the research was to identify themes and describe in the participants' own words the lived experiences of clinical instructors as they learn to conduct clinical instruction and function as adult learners.

Mixed methodology research is more than research using both methodologies. The researcher selects the methodology or methodologies based upon the nature of the question itself. If more than one methodology is called for, the different methodologies can be applied sequentially or simultaneously. The guiding theory may determine if one methodology takes priority or dominance over the other (Creswell, 2003).

In this study, quantitative research precedes qualitative research in order to guide and focus the qualitative research investigating the phenomenon of clinical instruction. Strauss and Corbin (1990) suggested that following quantitative research, a researcher might conduct a qualitative study to illustrate or clarify a phenomenon. If a result was surprising in the quantitative study, a researcher might delve into this aspect in more depth. The quantitative data can help the researcher determine what terminology to use, what definitions to use, and then what questions to use and anticipate areas to probe in the qualitative research. This is what Creswell (2003) called the sequential explanatory strategy of mixed methods research.

It is also possible to collect data with qualitative and quantitative methodologies simultaneously. This can take less time to collect the data but it also takes more planning and care to carry out both methodologies and data interpretation correctly. Frequently researchers use both methodologies simultaneously to validate or corroborate findings in a study. Creswell (2003) called this the concurrent triangulation strategy. Because the purpose of the quantitative questionnaire was to guide the qualitative research in this study, the methods were done sequentially. In addition, the two methodologies served to validate the findings of each other as the results of each phase of the research were compared and combined in the final analysis.

According to Creswell (2003), the mixed methods approach uses the philosophy of pragmatism as opposed to constructivism for qualitative and postpositivism for quantitative approaches. He described pragmatism as "consequence-oriented, problem-centered, and pluralistic" (Creswell, 2003, p. 18). In the current research, the focus was qualitative, however, the quantitative phase served to inform the qualitative research and confirm the findings of the qualitative phase. The two phases were used together to pragmatically arrive at an objective.

Denzin and Lincoln (2005) described the qualitative researcher as a *bricoleur*, a quilt-maker or montage artist who pieces slices of reality together. A qualitative researcher seeks to discover participants' stories of their experiences and put them together in an effort to understand the experience or phenomenon better. Denzin and Lincoln explained that "the combination of multiple methodological practices, empirical materials, perspectives, and observers in a single study is best understood, then, as a strategy that adds rigor, breadth, complexity, richness, and depth to any inquiry" (2005, p. 5). Richardson and St. Pierre (2005) preferred to use the imagery of a crystal to describe the examination of an object of study as opposed to the imagery of a triangle. They explain that since crystals are multifaceted, grow and change, and cast different

patterns, crystallization is a better description than triangulation for this qualitative research process. In the current research, the phenomenon of learning clinical instruction was examined using multiple methods in order to fully describe the phenomenon.

Flick (2002) called triangulation, the use of multiple methods, an alternative to validation. In this research the results from the Phase I quantitative questionnaire and the results from the Phase 2 interviews were compared for consistency. The results were also compared with the literature. Other methods of data collection, such as artifacts were not appropriate for this research. Journaling by the participants was not an option for several reasons. One reason is that the research asked for both retrospective data, memories of the participants as well as current learning practices. Another reason is that, as this research confirmed, medical laboratory scientists are not interested in reflection as a whole and they do not have time to journal.

The researcher must integrate the data collected by mixed methods at some point or points of the research. When the integration occurs depends on the sequence of the methods. The interpretation and presentation of the data may also differ depending on the sequence of methods used. For example, quantitative data with preceding literature review may be presented and discussed first if it was performed first. In this study, the sequence of the research occurred as follows: the literature for both methodologies was reviewed, followed by collection and analyses of the quantitative data, interpretation of the quantitative data, and collection of the qualitative data. Analysis of the qualitative data was done on a continuous basis during the data collection and integrated with the data and informed by the data from the quantitative research.

The advantages of using mixed methodologies include the ability to fill in the gaps and avoid the shortcomings that one methodology alone would have. This can result in a more rich

and potentially more valid and reliable study. The results can be generalizable and also richly descriptive.

Sequential research, however, takes more time than a single methodology would take. Other disadvantages of using mixed methodologies can be overcome with diligence by the researcher. The researcher must justify the use of both methodologies and must be experienced in both methodologies. The researcher must also combine the results of both methodologies, interpreting the results within the limitations of each methodology and addressing the validity of each method.

A questionnaire was developed to collect data for Phase 1, the quantitative portion of the study. According to Gay and Airasian (2000), questionnaires have the advantages of being relatively inexpensive to use and easy to score. They are also standardized and anonymous. In this study, a questionnaire provided comparable information from participants at different clinical sites. Questionnaires were self-administered; participants filled out the questionnaires themselves as opposed to being asked the questions verbally on the telephone or in person or filling out the questionnaire online. The potential disadvantages of misinterpretation of the questionnaire questions and the inability of participants to explain their answers (Gay & Airasian, 2000) were minimized in this study by reliability and validity checks described below. See Appendix A for the questionnaire instrument.

During Phase 2, the qualitative genre used was psychological phenomenology as described by Creswell (1998). The method of analysis was that described by Moustakas (1994) with adaptations suggested by Merriam (2009). Psychological phenomenology involves the study of experiences of individuals as opposed to groups or cultures. I was looking to discover the essence of the phenomenon of learning clinical instruction. I intended to “report the meaning

individuals ascribe to their experience" (Creswell, 1998, p. 235) and reduce the meanings of all of the individuals to an essence that describes the experiences of clinical instructors learning to conduct clinical instruction, learning to teach "on the bench." I did not want to simply survey the participants to see what forms of education they have used, seminars at state professional meetings, for example. I wanted to explore how they came to use various forms of education and what motivated them to learn more about clinical instruction. I wanted to know what and how much they learned from informal education, such as what they learned from mentors, each other, students, or trial and error.

During the qualitative phase of the study, I gathered data through interviews. In order to get a rich description of the experience of clinical instruction, I gathered data from clinical instructors with a range of experience, from clinical instructors who had been teaching for a few years to very experienced clinical instructors.

My relationship and role

In my role as a medical laboratory science faculty, I rely upon clinical instructors to instruct my students in the clinical setting. I believe that this experience, what non-healthcare professions sometimes call "fieldwork," is very important for the student's attainment of cognitive, psychomotor, and affective professional objectives. For the past 30 years, I have taught cognitive and basic psychomotor skills in the subjects of hematology and clinical chemistry in campus settings. My teaching has included lecturing on disease states diagnosed by hematologic and biochemical laboratory tests, as well as teaching student laboratories on campus where the students are introduced to skills used in clinical laboratories. I also act as the academic clinical coordinator in the areas of hematology and immunohematology and I have also coordinated clinical chemistry clinical rotations. As an academic clinical coordinator, I am

responsible to the medical laboratory science program and the university for the clinical rotations in the hospital laboratories. Although the students are actually taught by the clinical instructors who are hospital employees, I see that the experiences and assessments meet the objectives of the program. The hospital coordinator/facilitator/liaison (who communicates with the university academic coordinators or faculty) and department supervisors assign laboratorians to be the clinical instructors for the student(s). For six years I taught at a college of nursing and allied health, giving me an introduction to nursing and allied health professions and their clinical education practices. This experience gave me the insight to interpret the non-medical laboratory science literature as it applies to clinical instruction in medical laboratory science.

In talking with clinical instructors, their supervisors, their coordinators, and from anecdotes told to me by students over a period of many years, I have seen that clinical instructors vary greatly in their ability to conduct clinical instruction. I have wondered how they learn to instruct, what happens during their tenure as an instructor, and what can be done to help them. I have had limited personal experience in clinical instruction, instructing University of Pittsburgh laboratory students on the coagulation bench more than 30 years ago.

Sampling

Moustaskas (1994) stated that it is essential for participants in a phenomenological study to have experienced the phenomenon being studied. He stated that they should be interested in understanding the phenomenon and should be willing to be interviewed and recorded. In this research, participants who have experienced the phenomenon of clinical instruction were used. Clinical instructors in this study were employed by clinical affiliates (hospitals/medical centers) of medical laboratory science programs in the Midwest. Before Phase 1, I contacted program directors of university-based medical laboratory science programs in the Midwest to determine

who would be willing to help with this research. These sites represented six medical laboratory science programs in Illinois, Indiana, and Missouri.

Some program directors directly helped with the questionnaire; others gave me the name of the coordinator at each clinical site to serve as a contact who distributed, collected, and returned the questionnaires. Questionnaires were sent to the program directors or coordinators via mail or email, whichever medium they requested. They were asked to keep track of how many questionnaires they distributed. A week after the questionnaires were sent to the program directors or coordinators, a reminder email was sent. Some coordinators never replied and never sent returned any questionnaires. It took several email and/or phone call reminders over a couple months for some to respond.

The projected sample was 600 participants if the 6 programs averaged 10 clinical sites and each clinical affiliate averaged 10 clinical instructors. With the shortage of laboratory staff and the economic crunch, medical laboratory scientists are working extremely hard and barely have time to teach much less fill out questionnaires. Therefore, I did not expect a large return for this fairly long questionnaire. The number of questionnaires distributed was 293. Although I sought a minimum number of 60 completed questionnaires, I only received 51.

In order to optimize the response rate, cooperation was sought first. I was also hopeful for a good return as highly educated participants and educators tend to respond well to questionnaires (Fowler, 2002). The sample was not a random sample and therefore the results do not necessarily reflect all clinical instructors in medical laboratory science. Respondents were probably instructors who are highly motivated and interested in education. This created a good pool from which to select participants for the qualitative research. However, potentially it made the results of the questionnaires less generalizable to the population of all clinical instructors in

medical laboratory science. The intent of this research, however, was to provide a description of the experience of clinical instructors as they learn to teach, so generalizability was not a goal. The purpose of this research was not necessarily to describe all clinical instructors or even the "typical" clinical instructor.

Clinical instructors from hospital-based medical laboratory science programs were not used in this research. About half of the MLS programs in the United States are hospital-based programs where all of the academic content is covered at the medical institution as opposed to most of it being covered at a university. In hospital-based programs, the clinical instructors are usually involved with both the didactic part of the course and the clinical instruction. They are also more involved with the entire curriculum. Thus, instructors in a hospital-based program may have different experiences than clinical instructors in a university-based program where they usually only teach at the bench. In hospital-based programs, the students are at the hospital for one year (usually 11-15 months); whereas in university-based programs the students do hospital rotations for less than six months, sometimes at more than one hospital. The rotations for both hospital-based programs and university-based programs usually involve attendance by the students on day shift for three to five days a week. Thus clinical instructors from hospital-based programs were not participants in this research because their data could potentially confound the results because of their different experiences.

For the qualitative research, the sample included six clinical instructors. Twelve participants in the quantitative questionnaire volunteered to participate in the interviews. I was looked for articulate and thoughtful individuals as indicated by the responses on the questionnaire. The purpose of interpretive research is to obtain rich descriptions which lead to an understanding of the phenomenon. An inarticulate person may not give responses that are useful

for the study. Five people were selected from these volunteers based upon convenience and variety of experience.

I hoped to have a mix of both male and female instructors for the interviews. As expected, there was a preponderance of female volunteers for the interviews. Of the 12 volunteers for the interview phase, only one was male and he lived over 250 miles away. Instead of using him for the qualitative phase, I found a male participant when one of the female interview participants identified an experienced and articulate male participant to interview. Sampling where some participants find other participants is called snowball sampling, an acceptable form of sampling for qualitative research (Merriam, 2009).

The questionnaire included a brief written explanation of the research, their proposed role in it, and potential benefits and risks. An explanation of the research, IRB information, and contact information was included on the cover page of the questionnaire (see Appendix A). Participants remained anonymous unless they signified that they would like to participate in the qualitative phase of the study. The page indicating that they want a copy of the results of the research was separated from the questionnaire before analysis so that their name or email address could not be linked to the questionnaire. Participants in the interviews received an informed consent form which included a written explanation of the research and their participation (see Appendix B). The human subjects committee at the University of Missouri-St. Louis approved this research (June 2009, renewed 2010 and 2011). Potential harm might be come from threatened self-esteem and embarrassment due to the personal disclosure necessary for the research. Participants were assured of confidentiality and the right to refuse to answer any question. Pseudonyms are being used for all names of people and institutions. The code for the pseudonyms and the original recordings will be kept in a locked filing cabinet in the researcher's

home. No one else has access to this filing cabinet.

Participants will receive a summary of the results of the research if they requested it. There was no remuneration for participation in the questionnaire part of the research. Each of the interviewees was given $35 for their participation because the interviews were held after their shifts were over.

All of the participants agreed to be interviewed as arranged; there was no attrition at this point. I tried to minimize attrition by conducting all meetings at the participants' places of employment and at their convenience. I also communicated with them by their preferred mode of communication (phone, email, in writing). At the time of the interviews and in the consent to participate I explained that participation in the research included follow up with them to confirm the accuracy of the descriptions of their experiences. I sent each interviewee the summary of their individual experience of learning clinical instruction that I wrote following analysis of the interview transcript. I also sent a copy of the thick, rich description of the phenomenon of learning to conduct clinical instruction. One participant failed to respond to repeated requests for follow up. After several attempts, I sent a message saying that I took her lack of response to be agreement with my interpretations. Other participants had to be contacted multiple times to respond to my requests for them to review the interpretations, but they did respond.

I used participants from clinical sites of the university at which I am currently employed as they represent participants from three cities in central Illinois not covered by other universities in the research. I did not distribute these myself; these were distributed by the clinical coordinators. I have no relationships with the other medical laboratory science programs, the universities, or the clinical sites. A pilot study for validation of the questionnaire and interview guide was done with clinical instructors from one of my own hospital affiliates. After analysis of

the questionnaires, it was evident that the responses were similar to those of other participants and thus were included in the research.

Instrument Development

With insight gathered from review of the literature, discussions with several MLS professors from other universities, and several education coordinators, a questionnaire was developed (see Appendix A). The questions were both closed and open-ended. Closed questions gave data for quantitative analysis and gave the participants a better idea what the researcher meant by the question. However, open questions were used to give me more information that I might not have known about the phenomenon of clinical instruction. Open-ended questions "permit the researcher to obtain answers that were unanticipated. They also may describe more closely the real views of the respondents" (Fowler, 2002, p. 91). As the purpose of the questionnaire was to guide the qualitative research on the experience of clinical instructors, open questions were helpful in identifying issues to investigate in further depth during the qualitative interviews.

Demographics such as age, length of time in the profession, length of time teaching, and data on participants' experience with clinical instruction were collected through the questionnaire instrument. The rest of the questions on the questionnaire were designed to elicit responses to answer the research question and subquestions (see Appendix C, Alignment of questionnaire questions with research subquestions). Some of the questions would potentially answer several, or even potentially address all, of the subquestions. For example, Question 21, "How do you determine if you need to improve or change your instructional technique(s)?" could elicit answers to all three subquestions, 1) What does a clinical instructor do to learn clinical instruction?; 2) What experiences do clinical instructors call upon to help them in

learning to be clinical instructors?; and 3) What, if any, adult learning principles do clinical instructors use in learning clinical instruction? The questions were arranged for a natural flow of conversation and ideas and gradually become more reflective.

The questionnaire instrument was field tested (pretested) with clinical instructors at one local hospital. As suggested by Fowler (2002), volunteers in the pretest were asked if each question will have consistent understanding by the participants taking the questionnaire and if each question will result in accurate and useful responses. To ensure consistent meaning to all participants, wording was carefully checked. Clarifying phrases or introductory remarks were added.

Face validity was assessed by a medical laboratory science educator and a sociology faculty member who does survey research. The questionnaire instrument could not be analyzed for reliability (internal consistency) using Cronbach's alpha as too many of the questions were nonmetric and covariances could not be calculated (Allen & Yen, 2002).

Data Collection

Phase 1. For the quantitative portion, questionnaires were sent to the program directors or coordinators by email or regular mail for them to distribute. Participants returned the completed questionnaire to the coordinators who then returned them to me by postage-paid return mail envelopes or in one case by fax. Two weeks later an email reminder was be sent to the program directors and coordinators asking them to remind their clinical instructors to return the questionnaires to them if they had not already done so. If responses from the program director or coordinator had not been received within six weeks, the researcher telephoned or emailed them again. When, after several months I had less than 60 responses, I sought participants at additional programs. No questionnaire responses resulted from these additional

programs. The lack of support from spur-of-the- moment research sites points out the importance of soliciting help and developing relationships with potential research sites.

An online questionnaire was not used because not all nonsupervisory personnel have access to the Internet in clinical laboratories. Questionnaires will be kept in a locked cabinet in the researcher's home for five years. No names or identifying information were included in the data compilation.

Phase 2. Prior to the interviews, I engaged in self-reflection of the phenomenon of clinical instruction which included completing the questionnaire and answering the interview questions. The purpose of this self-reflection was for me to be aware of my own understandings and biases about the phenomenon. This allowed me to hear the participants and see the data from their perspectives rather than my own. Husserl first named and described the process of Epoche process and Moustakas (1994) expanded upon this, explaining that Epoche is whereby the phenomenological researcher brackets, sets aside, previous knowledge and understanding in order to come at the research with a "purified" consciousness. Moustakas emphasizes the Epoche process so that the researcher can quarantine her own understandings of the phenomenon so that these do not influence the interview or analyses. Through my self-reflection and the process of this research, I developed a way of perceiving adult experience without judgment. Each participant's experience with the phenomenon was a discovery. I do think that it is important not to influence or guide the participants during the interviews, however I think that it is impossible to completely dissociated oneself from one's experience and understandings. Even Moustakas admits, "The Epoche is rarely perfectly achieved" (1994, p. 90). To completely discard your own experiences of the phenomenon is not necessary. Your self-reflection becomes part of the data collection if you have experienced the phenomenon yourself. Therefore, the importance of self-

reflection is to be aware of one's own understandings, opinions, and biases so that they can be acknowledged and put in proper perspective as one proceeds with the research. While this self-reflection process was occurring, the interviews were scheduled.

To facilitate participation and to put the participants at ease, all interviews were held at the work sites (hospitals) of the participants. Interviews were held immediately after work so that the participants would not feel rushed by having to go back to work. They were held in relatively private areas, including offices, a study area within a laboratory, and a break room. They were quiet enough for tape recording. An occasional interruption did not interfere with the discussions; participants quickly continued with the discussions.

I wanted to use some focus groups, if possible, in order to enrich the data through the interaction that occurs among the participants. In the situation that participants may not be comfortable self-disclosing to a researcher, focus groups can help get meaningful data (Krueger & Casey, 2000). Also, something that one person says may trigger a memory of someone else. Although I did not use focus groups of six to eight people as suggested by Krueger and Casey (2000), I conducted two group interviews of two participants when I found that they were able to meet at the same time and place.

For both the individual and the group interviews, I introduced myself to the participants. The purpose of the study and their involvement was explained. Participants were already familiar with the research, having volunteered through the questionnaire. The male interviewee who was recommended by his coworker completed the questionnaire before the interview. This way demographic information was collected. Also, by completing the questionnaire, his memories of learning clinical instruction would be stimulated, the same as the other interviewees. Consent

forms were signed and will be kept in a locked cabinet for the duration of the research and five years total.

An interview guide, a list of standard questions, was used to initiate communication (see Appendix D). As each interview proceeded, the questions were sometimes asked in a different order if the topic of a later question came up earlier in the discussion. Probes were added depending on each individual's responses in order to clarify responses or to encourage more detail or thought on a topic.

All interviews were recorded by both the computer program, Audacity®, and by a tape recorder. The Audacity® files were transcribed by the researcher. After transcription, each recording was compared to the written transcription three times and corrected if necessary. Tapes and notes taken by the researcher added structure to the data. No outside transcriptionist or note-taker was used. Tape recordings and a flash drive of the transcriptions will be kept in a locked file for the duration of the research and five years total. Data were coded on all electronic files.

Limitations

The major limitation of Phase I of this research is the low return rate for the questionnaires. Other possible limitations of Phase I are those of survey research: completeness of responses to open-ended questions, thoughtfulness of the participants, and accurate recall of the phenomenon by the participants. Although the return rate was low, most participants' responses were complete and thoughtful. Limitations of Phase 2 are the unwillingness of some participants to do member checks of their experiences In this research only one did not follow through with member checks), inaccurate or incomplete recall of the phenomenon, lack of openness by the participants, and lack of skill of the researcher in drawing out the recall of the phenomenon. Other limitations include the logistics of interviewing such as a warm or noisy

room. Logistics of recording the data could also be problematic, for example, the difficulty for the researcher to take notes at same time as interviewing, having to turn over the tape in the recording device, background noise, and interruptions. These did happen but they did not seem to be distracting.

Other limitations may include the logistics of transcribing, such as the implications of nonverbal cues and voice tone/inflection. The meaning could be the opposite of what was actually said depending on tone of voice or facial expression. For this reason, I added bracketed comments on the transcripts. The Hawthorne effect is also possible; that is, participation in this study may change the experience, especially for new clinical instructors (Gay & Airasian, 2000). Completing the questionnaire may have caused them to be more reflective or to seek ways to improve their instruction that they would not have done if they were not in the study. Lastly, some forms of triangulation were not be possible as these clinical instructors were not likely to be willing to keep a diary or journal and thus were not asked to keep one.

Interview guide

Individual interviews and group interviews were semi-structured with a predetermined interview guide (Appendix D). These questions were determined by the literature and personal experience. Questions were designed to elicit responses that revealed the participants' experiences. Fidelity was assured through open-ended questions and probes that encouraged a thorough exploration of the participants' experiences. The questions were field tested and the researcher gained experience in conducting the interviews via a pilot interview. After the Phase 1 questionnaires were collected and reviewed, the researcher had a better understanding of the experiences of clinical instructors learning to conduct clinical instruction and was then able to ask better probes to delve into the phenomenon.

The researcher took two graduate classes in qualitative research, one of which included practice interviewing and conducting focus groups. The researcher has done one phenomenologic study of the experiences of health care clinical instructors evaluating student performance. This research, which involved interviews and focus groups with 15 participants, was presented at a peer-reviewed conference. The researcher has also done a qualitative case study which was presented at a peer-reviewed conference and the abstract was published.

Analysis

Phase 1. A statistician was hired to enter data from the questionnaire into a password protected Excel file. Coding of the data for analysis was done by the statistician in consultation with the researcher. Coding of open response questions was done by the researcher. Data entry was verified by the researcher. Statistical analysis of the questionnaire data was performed using IBM® SPSS® Statistics version 19.

Crosstabs and chi-square were run for categorical variables. These nonparametric tests are appropriate for data that are proportions as in the results of a survey. Crosstabs is a cross tabulation done by IBM® SPSS® which shows the relationship between two or more categorical variables using a tabular format. Chi-square tests of independence were then run comparing the observed frequencies with expected frequencies. Significance was determined using $\alpha = .05$. Assumptions and limitations of chi-square are 1) observations are independent, and 2) expected cell values should be 5 or over especially if the degrees of freedoms are low (Gravetter & Wallnau, 2000). The observations, questionnaire data, were indeed all independent. Analyses with greater than 25% of the cells with expected values of 5 or less were not considered. The interpretation of analyses with an expected cell value of less than 5 is discussed in Chapter 4.

The null hypotheses were that for the general population of clinical instructors, there is no relationship between the variables studied.

For comparison of one continuous dependent variable, such as age, years in the profession, or years as an instructor, against one categorical independent variable, multiple analyses of variance (ANOVA) were used. Assumptions of ANOVA include 1) observations within each sample are independent, 2) populations are normally distributed, and 3) populations have equal variance (homogeneity of variance) (Gravetter & Wallnau, 2000). The observations were independent. The populations were normally distributed and had very close variances regarding age, time in the profession, years as clinical instructor. This analysis asks if the differences are caused by chance or result from true differences in the populations from which samples were taken. Alpha of .05 was used. The null hypotheses were that there was no difference between the means of the groups studied.

The analyses run are listed in Appendix E. The results of the ANOVA and chi square procedures are presented in Chapter 4.

Phase 2. Analysis of the qualitative data involved systematic examination and creative reflection. The experiences of each participant revealed to me a new angle on the phenomenon. Each participant's perceptions and thoughts led me to discover something new that changed my understanding of the whole phenomenon. I immersed myself in the data in order to make sense of the data (Lincoln & Guba, 1985). Entire transcripts were read as they were completed and again as the analysis for themes took place (Tesch, 1988). In qualitative research, analyzing the data as the research proceeds is preferred over waiting to analyzing everything after all of the data are collected (Merriam, 2009). This allows earlier data to illuminate the data collection with following participants and prevents the data from being repetitious and overwhelming. Merriam

(2009) even suggests trying out ideas and themes being considered from previous interviews on subsequent participants.

I asked each participant to check the description of their experience for accuracy and comment on the thick, rich description of the phenomenon of a MLS clinical instructor learning to conduct clinical instruction. Five participants did review the summary of their experience. None of the participants had corrections or clarifications and all expressed that they felt their summary and the thick rich description were accurate. Participant D, Dana, responded to the summary, "Wow, that was a really nice summary." Participant B, Bonnie, commented on the thick, rich description, "That could have been me!" This was particularly satisfying, as the goal of a phenomenologic study is to have people who have experienced the phenomenon identify with the description of the phenomenon.

At various points in the analysis cycle, data were compared to published literature and the quantitative questionnaire results. Analysis occurred in light of the theoretical underpinnings of adult learning, informal learning and experiential learning. As new issues appeared, further literature searches helped in the design of follow up questions for future interviews. This literature also informed the analysis of the interviews.

I followed the qualitative analysis described by Moustakas (1994). I first wrote a full description of my own experiences with the phenomenon, including my opinions and beliefs about clinical instruction. This helped me become aware of opinions and feelings that I brought to the research myself. While reviewing the experiences of clinical instructors, I could then be more objective. Having examined my own experiences, I then recognized them in order to understand the participants' experiences from their own point of view.

Horizonalization was then performed from the transcripts and notes. The goal of this process is to identify horizons that will help to understand the phenomenon. Moustakas (1994) explains that this process can be a never-ending one as you reconsider them and view the data from different angles. He says, “We consider each of the horizons and the textual qualities that enable us to understand an experience” (p. 95). For me this involved listing significant statements of participants and giving them equal value. Two colleagues reviewed the transcripts of a group interview to see if they agreed with the significant statements I had identified. Each reviewed a different interview. This served as a check of the accuracy of the interpretive analysis. The colleagues agreed with the horizonalization statements, although one suggested that I define some of the technical terms used by the participants. As a result, I added definitions to the transcripts in brackets.

After the statements were listed, I clustered them into meaning units. These were listed with textual description of the experience with reference to the verbatim examples in the transcripts. I collapsed these meaning units into potential nonoverlapping themes.

At this point, according to Moustakas, in the next step the researcher reflects on her own description and uses imaginative variation or structural description, seeking all possible meanings and divergent perspectives, varying the frames of reference and constructing a description of how the phenomenon was experienced by the participants. After this, I constructed an essence of the experience for each participant and eventually an overall rich description of the experience of a clinical instructor learning to conduct clinical instruction.

I performed a member check at two points of the qualitative analysis to have the participants confirm the reliability of the data. This step is strongly suggested by Merriam (2009) to assure internal validity. The first member check involved sending them a summary of their

experience learning to conduct clinical instruction and the second was to send them the final rich description of learning to conduct clinical instruction to see if these resonated with them. I asked for corrections or explanations that they wished to provide.

The entire analysis process was documented. Each list or grouping of the researcher was documented. I asked the same colleagues to perform a peer review of the research to see whether the preliminary themes of the phenomenon accurately reflected the data that they had reviewed earlier. They thought that the preliminary themes accurately reflected the participants' experiences, but one colleague suggested I had not sufficiently stressed the participants' reliance on experiences they had as students. The other colleague suggested that I organize the themes with subthemes (which I did).

Trustworthiness

Trustworthiness is the characteristic of research which makes it believable and accepted by the scientific community because of careful design and the use of accepted standards (Merriam 2009). The quantitative methods used in this research did conform to the assumptions of each as described previously. According to Merriam (2009), traditional quantitative research uses internal validity, external validity, reliability, and objectivity; whereas credibility, transferability, dependability, and confirmability are now used in qualitative research. In her chapter, "Dealing with Validity, Reliability, and Ethics," however, she uses the terms 'validity' and 'reliability' to discuss the trustworthiness of qualitative research. As this research used mixed methods, validity and reliability will be the terms discussed here.

In order to address the internal validity or credibility of the questionnaire, a medical laboratory science educator who is a Ph.D. candidate in adult education reviewed the questionnaire for face validity. Face validity of the interview questions was assessed by a

sociology professor with extensive experience in interpretive interviewing. Internal validity of the interviews was addressed through member checks. In order to assure that coding was consistent, that the themes and conclusions are not solely constructs of the research but are accurate descriptions of the phenomenon; several stages of the research were checked by other people. Each participant was asked to check the accuracy of the summary of their interview and was also asked to check the accuracy of the final description of the experience (Lincoln & Guba, 1985; Stake, 1995). In addition, in order to check the auditability of the research, the researcher asked two colleagues to review interview data and the conclusions that the researcher made from that data.

Validity of the research as a whole was assured by triangulation. The questionnaire responses were used to inform the qualitative research and were compared with the interview responses to see if the interview responses from selected interviewees concurred with the responses from the group surveyed by questionnaire. The research also used multiple sources of data, multiple participants, as opposed to biography or case study research. The number of participants was sufficient to result in saturated data.

External validity which results in generalizability, was not a focus of this mostly qualitative research. For example, sampling was not random for either Phase 1 or Phase 2 but depended upon volunteers. On the other hand, the sampling in this research was intentionally varied by using six different university medical laboratory science programs for Phase 1 and selecting the six interview participants from four different hospitals. Qualitative research can result in transferability. “Every study, every case, every situation is theoretically and example of something else. The general lies in the particular; that is, what we learn in a particular situation we can transfer or generalize to similar situations subsequently encountered” (Merriam, 2009,

225). According to Merriam, transferability in qualitative research is enhanced by the richness and detail in the description of the phenomenon.

Reliability or consistency is difficult to assure in behavioral research such as adult education research because of the uniqueness and complexity of behavior. One part of reliability lies in internal validity which is discussed above. Merriam (2009) suggests that an audit trail is another was to assure reliability in qualitative research. It would be difficult to replicate this research identically as the layers of an experience will continually reveal themselves the more it is studied and the more different angles are used, so reliability was maximized by an audit trail. The audit trail consists of detailed descriptions of the analysis procedures and documentation of the steps of analysis. Examples of horizonalization and grouped horizons from Flo's interview are included in the Appendix I and Appendix J, respectively. Appendix K includes the horizons grouped from all six interviewees. Appendix L lists the meaning units (preliminary themes) drawn from contemplation of the grouped data, repeated readings of the transcripts, and repeated readings of the data from the open-ended questions from Phase 1.

Reliability is also assured by having a sufficient number of participants to describe the phenomenon as it exists at the site of the research. By the interview with the sixth participant, saturation was obtained. That is, little or no new information was elicited, although the data from the latter participants provided more examples of the emergent themes.

Triangulation in the design of this research also established credibility. The quantitative and qualitative data from the questionnaires were compared with the experiences of the clinical instructors described in the interviews. The elements of time and history could potentially confound this type of research; however this had little or no effect. The data from questionnaires and interviews were all collected within about a one year period and nothing, to my knowledge,

happened from then until the final interpretation of the data that would affect the interpretation. In Chapter 5, I discuss some changes that have occurred since the clinical instructors learned how to conduct clinical instruction and how that could change the experiences of newer clinical instructors.

Summary

This research resulted in themes that help to develop a rich description of the phenomenon of how clinical instructors learn to conduct clinical instruction, relating lived experiences of clinical instructors to their learning of clinical instruction as experienced by clinical instructors in medical laboratory science programs. Transferability of these descriptions to clinical instructors in other medical laboratory science programs and other allied health clinical instructors lie in the rich detail of the research. Although the context of the research is instruction in just one allied health profession, I anticipate that people involved with instruction in other settings will recognize themes in common with their contexts. Implications for the training of clinical instructors or the need for training may warrant further research.

Chapter 4 includes the results of the quantitative and qualitative research. Chapter 5 includes discussion of these results, conclusions, and implications in light of the literature and suggests areas for further research.

Chapter 4

Results

Clinical instructors play a crucial role in the education of medical laboratory scientists. They educate students in the clinical setting, at the bench, showing students how to perform laboratory procedures, run instruments, and introduce them to the hospital culture. In addition they function as role models for the laboratory profession. Clinical instructors seldom begin teaching with any experience doing clinical instruction. The primary purpose of this study was to investigate how clinical instructors of medical laboratory science students learn to conduct clinical instruction. Secondary research questions were:

1. What does a clinical instructor do to learn clinical instruction?
2. What experiences do clinical instructors call upon to help them in learning to be clinical instructors?
3. What, if any, adult learning principles do clinical instructors use in learning clinical instruction?

The research consisted of two phases. During Phase 1, a questionnaire was distributed to clinical instructors in hospital affiliates of six university medical laboratory science programs in the Midwest. Phase 2 consisted of qualitative interviews of six clinical instructors. In this chapter, the results of the two phases will be described.

Phase 1 – Questionnaire

Questionnaires were distributed to the clinical instructors through the education coordinators or program directors of six university programs in the Midwest. They distributed 273 paper copies of the questionnaire and 51 were returned, for a response rate of 19%. One

university program director who had previously indicated a willingness to participate did not respond to several requests to distribute questionnaires.

A low response rate was expected for several reasons. First, distribution and return of the questionnaires was dependent on the good will and efforts of the university and hospital contacts. Second, medical laboratory scientists are frequently working short-handed. The economic situation and health care reform have resulted in pressures for hospitals, and thus laboratories, to reduce costs (Kaufman, 2011). In addition, an increasing number of baby boomer employees are retiring. As a result, empty positions frequently go unfilled. Those medical laboratory scientists who function as clinical instructors have an even more difficult task of working the bench while teaching students. Only highly motivated clinical instructors were likely to complete the rather lengthy questionnaire. All of the returned questionnaires were usable. In fact, all of the respondents took the time to complete at least some of the open-ended questions as well as the questions with Likert-like scales. The questionnaire, cover letter, and page to volunteer for Phase 2 are included in Appendix A.

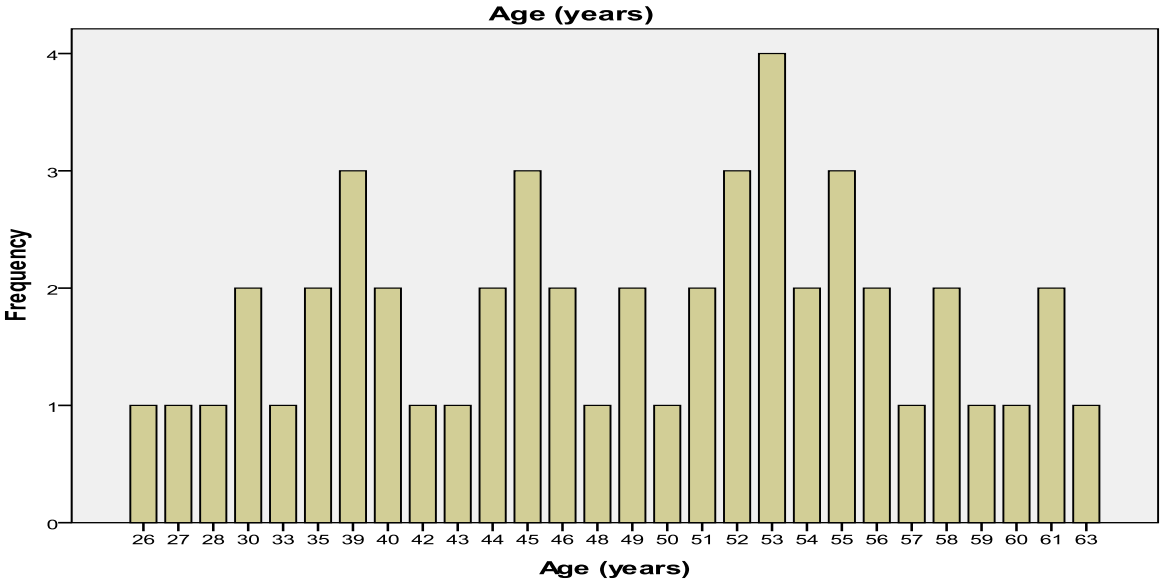
The questionnaire data will be described in three sections:

1) descriptive statistics including summaries of responses to open ended questions
2) statistical analyses
3) summary

Phase 1 Descriptive Statistics. Data from the questionnaires were entered into an Excel® spreadsheet by someone who was hired to perform this. She was recommended for her knowledge of Excel® and IBM SPSS®. The accuracy of the data entry was checked by the researcher. Demographic data were compiled on the following: age, gender, year in the

laboratory profession, supervisor status, type of certification, university affiliation of their lab, and department in which they teach (Questions 1-7).

The ages of the participating clinical instructors ranged from 26 to 63 years old with a mean of 47 and a median of 50. The difference between the mean and median reflects a bulge of baby boomers around ages 52-55, seen in Figure 1. Only one participant omitted this information.



Age Distribution

Figure 1

Ninety percent of the participants were female; ten percent were male. This distribution reflects the predominance of females in this health care profession.

The length of time in the laboratory profession ranged from 2 to 40 years, with both the mean and median of 23 years. Only 12% of the participants identified themselves as supervisors.

In response to Question 5 of the questionnaire, 77% of the 49 people who listed their certification were MLS/MT (medical laboratory scientists/medical technologists). Ten percent were certified as MLTs (technicians), and 8% had a categorical certification (certification in only

one area), and 2% had no certification. Two did not complete this question. Table 1 displays this data. For Question 6, only 8% of the respondents had certification as a specialist.

Table 1

Type of Certification

Certification	Percentage
MLS/MT	76.5%
MLT	9.8%
Categorical	7.8%
None	2.0%
No answer	3.9%

In Question 7, participants also listed the laboratory department(s) in which they primarily teach. This distribution is seen in Table 2. Eight participants stated that they taught in more than one of the major laboratory departments. Of the participants who taught primarily in one department, hematology and microbiology were the most frequently cited departments, although all departments were well represented. The participants who listed “Other” listed urinalysis and immunology as subjects (benches) that they taught.

Table 2

Primary Responsibility for Teaching

Department	Percentage
Hematology, coagulation, flow cytometry	25.5%
Microbiology, virology	21.6%
Blood bank	15.7%
Chemistry	15.7%
Other (urinalysis, immunology)	5.9%
>1 major department*	15.7%

*2 (9%) said "all areas"

Questions 8-10 were questions about the participants' clinical instruction background: how long they have been doing clinical instruction, how many students they teach at one time, and how many student they have taught in the last year and last three years. Participants in the study have taught in the clinical setting, that is, they have been clinical instructors, from 0.5 to 36 years, with a mean of 15 years. When this is compared to the average length of time in the profession (23 years), one can see that the average length of time in the profession before teaching is eight years. This is explained by the fact that most new graduates work on the evening and night shifts when there are no students. As they get more seniority, they move to the day shift and where they may become clinical instructors.

Most clinical instructors (57%) teach only one student at a time, 37% have up to two students at a time, and 6% have more than two students to teach at a time. The number of students taught during the last year ranged from 1 to 25. The number of students taught during the last three years ranged from 2 to 75.

Question 11 asked how the participants became clinical instructors. The majority of the participants (59%) were assigned to be clinical instructors, while 35% asked or volunteered to be clinical instructors. The two people (4%) who put "Other" explained that they became a clinical instructor because it was part of the job. Only one (2%) went through an application process to be a clinical instructor. This data is found in Table 3.

Table 3

How Clinical Instructors Become a Clinical Instructor

Responses	Percentage
Was assigned	58.8%
Asked or volunteered	35.3%
Went through an application process	2.0%
Other (part of the job)	3.9%

In Question 12, participants were asked what reward(s) they get for being a clinical instructor. They were allowed to select multiple answers, so the total is more than 100%. Participants reported that the primary reward for being a clinical instructor was self-satisfaction (56.9%). The next most common answer was "no reward" (31.4%), followed by "get to put on my resume" (25.5%). Only one participant reported being paid extra to teach, and only one participant reported being rewarded by the esteem of their peers. The nine participants (17.6%) who selected "other" mentioned that they were rewarded by or because:

- "Grads are properly trained when we hire them."
- "Confidence that I am current with developments in the area"
- "I like doing it."

- “Considered part of the job.”
- “Helping others”
- “I enjoy interaction with younger teacher-to-be”
- “Knowing I am helping someone learn the profession thoroughly and ethically”
- “Lets me review things”
- “Helping new clinical laboratorians”

Phase 1 Subquestion One. The rest of the questions on the questionnaire were designed to elicit responses to answer the research question and subquestions. A table showing the alignment of the questions with the research subquestions is found in Appendix C. Some of the questions would potentially answer several, or even potentially address all of the subquestions. The following section details the responses to the questions designed to answer the first subquestion, “What does a clinical instructor do to learn clinical instruction?” As seen in Appendix C, the questionnaire questions designed to answer this question were Questions 13, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 32, and 33. All of the responses to the open-ended questions can be found in Appendix F and Appendix G contains the tallied and grouped responses to the open-ended questions.

Question 13 was the first open-ended question, “How do you know how to be a clinical instructor in the clinical setting?” This question was put early in the questionnaire to get the participants’ responses off the top of their heads, before they might be influenced by or memories jogged by the subsequent questions. Three participants responded that they do not know how to teach. The rest of the responses fell into ten categories, as seen in Table 4. To explain how they knew how to be a clinical instructor, the participants most frequently cited

experience from teaching or training, experience as a student, and observing other clinical instructors.

Table 4

How CI Know How to Do Clinical Instruction

Responses	No. of Participants
Experience from teaching or training	11
Experience from teaching (6)	
Training new techs or as if they were new techs (2)	
Teaching elsewhere (2)	
Being asked questions (1)	
Input from teachers who trained elsewhere (1)	
Experience as student	8
Observing	8
Follow checklists/teaching guide	7
Work experience	7
Understand the work completely (4)	
Do the job and explain it (3)	
Common sense, comes naturally	4
Workshop or course	4
Workshop or course (3)	
A teaching course during undergrad program (1)	
Internet reading	2

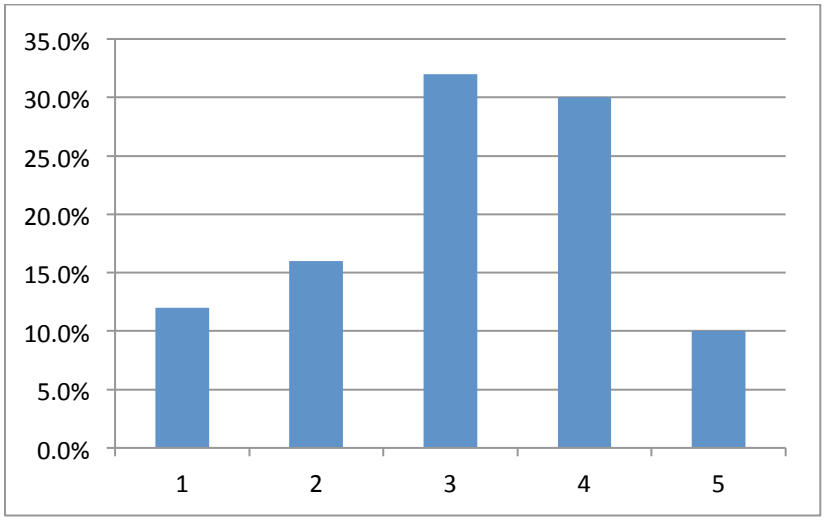
How CI Know How to Do Clinical Instruction

Table 4 (continued)

Life experience	1
Consulting with the university	1

Questions 17 and 18 addressed whether the participants thought that everyone can be a clinical instructor and whether everyone should be a clinical instructor. The majority of participants (61%) thought that everyone with their credentials can be a clinical instructor. Interestingly, both the ones who said no and the ones who said yes mentioned in the open-ended part of the question that clinical instructors need to have experience, have the interest and ability to teach, and be bachelor-degreed MLS. A couple of people mentioned the ability to speak English or have a US degree. Only 12% said that everyone should be a clinical instructor. They felt that some people just cannot teach or do not want to teach. They mentioned that some people just do not have the people skills, patience, personality, or positivity needed to teach. As expected, all of the participants who said that everyone should be a clinical instructor also said that everyone can be a clinical instructor. All of the comments can be seen in Appendix F under Question 18.

The participants were spread across the board on the question of how much they think about or reflect on being a clinical instructor (Question 19). Twelve percent of the participants said that they never think about it, 10% said that they think about it even when they are not teaching, and the rest were scattered in between. The mean was 3.2; responses ranged from 1 (*Never)* to 5 (*Even when I am not teaching*). See Figure 2.

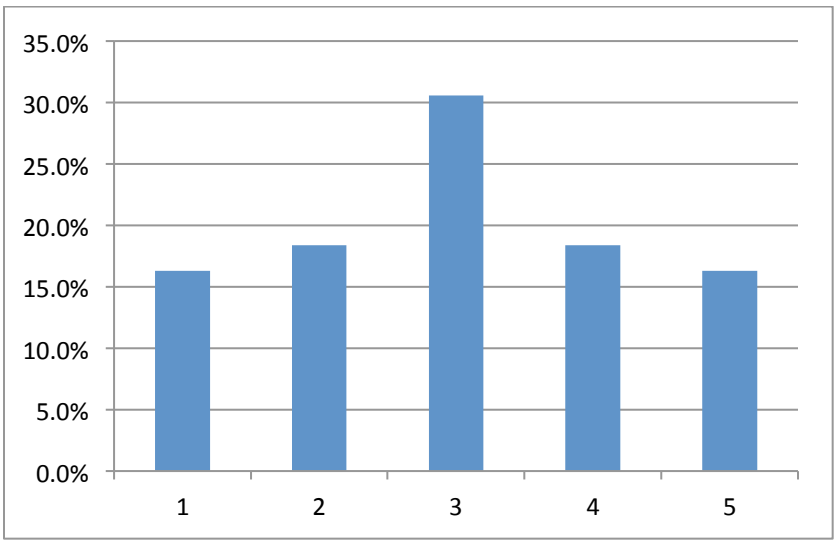


Never Even when not teaching

Reflection on Being a Clinical Instructor

Figure 2

Likewise, the responses to Question 20, "How much has your teaching technique changed since you became a clinical instructor," are evenly distributed with a mean of 3.0. Responses ranged from 1 (*None*) and 5 (*A lot*). The data are displayed in Figure 3.



None A lot

Change in Teaching Technique

Figure 3

Question 20a was an open-ended question that asked, “Why did your teaching techniques change?” Responses fell into four categories: things changed, gained experience, so students will learn better, and advice from others. Subcategories of answers in each category can be seen in Table 5.

Table 5

Why Teaching Techniques Changed

Responses	No. of Participants
Things changed	10
Lack of time, increased workload (4)	
Technology changed (2)	
Had to become more flexible	
Need to document	
Students change	
University standardized the exams	
Gained experience	9
Gained experience (5)	
Developed confidence (3)	
Realized what not to cover	
So students will learn better	9
Feedback from students (2)	
So student will learn better (2)	
Had to adjust to different students	
Had to cope with students who are test-grade oriented	
Started thinking about it from students’ perspectives	
Students were bored with mechanisms of analyzer	
To help students think through things	

Why Teaching Techniques Changed

Table 5 (continued)

Advice from others	4
Advice from course or university (3)	
Feedback from coworkers	

Question 20b was also open-ended and asked, “How did your teaching techniques change?” Responses fell into four categories: methods of teaching changed, attitude changed, content changed, and resources used changed. The number of participants listing each technique is in parentheses if more than one participant mentioned it. Subcategories of answers in each category can be seen in Table 6.

Question 21 was an open-ended question that asked, “How do you determine if you need to improve or change your instructional techniques?” Responses fell into four categories: indirect feedback from students, direct feedback from students, feedback from others, and changes in the field or teaching. Subcategories of answers in each category can be seen in Table 7.

Table 6

How Teaching Techniques Changed

Response	No. of Participants
Method of teaching changed	21
Step back and let student do it, real time instrumentation (4)	
Added independent learning activities (3)	
Slow down my instruction, don't overwhelm the students (3)	
Individual instruction for different students (2)	
Added problems to practicals	
Became faster and more to the point	
Better getting quiet students to talk	
Better intro/orientation the first day	
Don't give students the answer right away	
Made schedule for rotation	
More clear explanations	
More organized	
Work off of students, see how they are following	
Attitude changed	12
Be more thorough (2)	
Better listening (2)	
Make sure to have answers (2)	
More patience (2)	
Ask instead of tell	
More compassionate to student	
Reflect more on students' questions	
Spend as much time as I can with student	
Content changed	7
Teach less theory (3)	
Added manual tests	
Include new information	
Less clinical information on the patients	
Simplified, less detail	
Resources used changed	5
Added flashcards	
Added Internet sites	
Give more case studies	
Give more handouts	
Use of visual methods	

Table 7

How CI Determine if They Need to Improve or Change

Response	No. of Participants
Indirect feedback from students	29
Feedback from students and student evaluations (20)	
Exam scores, certification exam scores (9)	
Direct feedback from students	27
If student can't answer questions, doesn't understand, can't do (24)	
Student interest level, yawns (3)	
Feedback from others	7
Feedback from fellow employees (4)	
Feedback from employers/coworkers of graduates (2)	
Feedback from the university (1)	
Changes in field or teaching	3
New information, technology changes (2)	
Hear of something new to try (1)	

The majority of participants (74%) had no mentor (Question 22). Only 10% of the participants had a formal mentor who was either a supervisor or a person assigned as a mentor. Sixteen percent had an informal mentor.

In Question 23, participants were asked to select methods that they had used to learn how to do clinical instruction. These methods are listed in Table 8. First they were asked to check whether they had used the method, if the method was required of them, and if they continue to use the method. Then they were asked to select the two most helpful methods. The four methods

most used were watching coworkers (88%), trial and error (82%), recalling methods used when they were a student (78%), and asking students what works the best (73%). Only 21.5% of the participants reported that one or more of the methods were required (8% were required to use more than one method). Going through an instructor's orientation or training was the most often required method but only12% reported that orientation or training was required. This study did not ask what was included in the orientation or training. These top four methods were used almost four times more often than the bottom four, being mentored, going through an instructor's orientation/training, going to a formal class on teaching, and reading about how to teach.

Table 8

Methods Used and Required to Learn CI

Method	I have used	This was required
Watching coworkers	88%	6%
Trial and error	82%	4%
Recalling methods used when you were a student	78%	0%
Asking students what works the best	73%	4%
Being mentored	27%	4%
Going through an instructor's orientation/training	20%	12%
Reading about how to teach	20%	4%
Going to a formal class/symposium on teaching	16%	4%
Other	14%	2%

"*Other*" methods listed were "forcing myself to do it," "university expectation list," "advice from college educators," "visual presentation," "taught phlebotomy at a community college," and "reviewing pertinent material."

The top four most helpful methods about learning how to do clinical instruction were asking students what works the best, trial and error, watching coworkers, and recalling methods used when they were a student. Not surprisingly these were the same methods that instructors continue to use and were ranked in the same order. These data are seen in Table 9.

Table 9

Most Helpful Methods and Methods Continued to Use to Learn CI

Method	2 most helpful	Continue to use
Asking students what works the best	39%	69%
Trial and error	29%	67%
Watching coworkers	29%	65%
Recalling methods used when you were a student	27%	55%
Being mentored	12%	12%
Going to a formal class/ symposium on teaching	10%	4%
Going through an instructor's orientation/training	6%	14%
Reading about how to teach	6%	10%
Other	10%	4%

The next table, Table 10, includes data from Question 24, “When did you first use the methods listed in the table above?” The largest number, 43% of the participants started to use the above methods to learn how to be a clinical instructor after finding out that they were going to have a student. Twenty-nine percent did not use any method to learn how to do clinical instruction until they were teaching their first student. Only 16% began learning to do clinical instruction before they knew they were going to be a clinical instructor.

Table 10

When CI Use Methods to Learn CI

When CI Use Methods	Percentage
When I found out that I was going to have a student	43.1%
While I had my first student(s) to instruct	29.4%
Before I knew that I was going to be a clinical instructor	15.7%
All clinical instructors at my facility/program had to do it	2.0%
After I received negative feedback about my clinical instruction	0%
Other –“taught many new employees and adapted those methods”	2.0%

In Question 25 the participants were asked to list these or other methods that they would like to use but have not had the opportunity to use. Only 27% responded that they would like to use a method that they had not used. The most desired methods they would like to use were going through an instructor’s orientation/training and going to a formal class on teaching.

Table 11

Methods CI Would Like to Use

Method CI Would Like to Use	No. of people
Going through an instructor's orientation/training	8*
Going to a formal class/symposium on teaching	6*
Reading about how to teach	2
Online teaching symposium	1
Visual means for instruction	1

*3 people put both of these methods

Question 26 asked how long their instructors' orientation or training was if they went through an orientation or training. Of the 20% of participants who said that they went through an instructor's orientation or training, the training lasted from 2 hours to 2 weeks.

Question 27 was an open-ended question which asked, "How do you decide when you need some help or advice on teaching or being a clinical instructor?" Four percent of participants responded that they had not needed help or advice. Other responses fell into five categories: direct feedback from students, need to solve a problem, feedback from others, indirect feedback from students, and self-evaluation. These data can be seen in Table 12. This question also served as an internal validity check by comparing the results to those from a similar question, Question 21, "How do you determine if you need to improve or change your instructional techniques." The answers came out remarkably similar considering that these were open-ended questions.

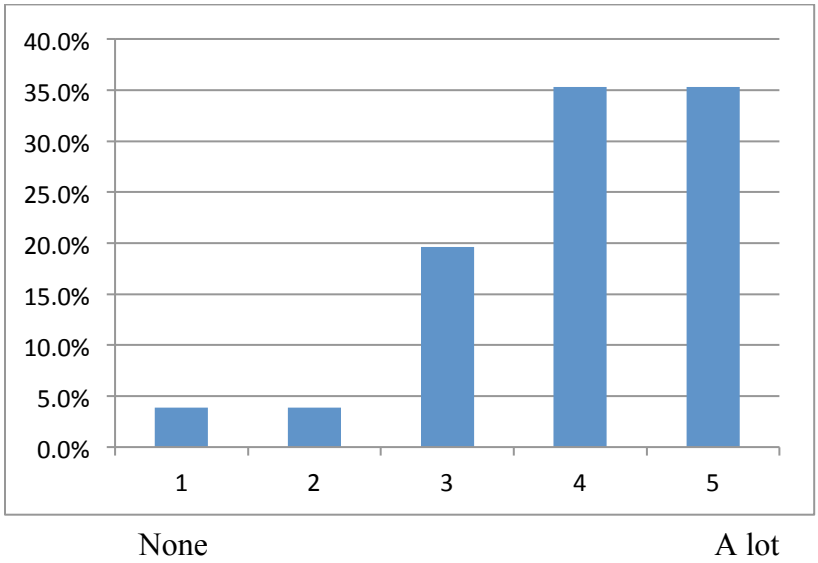
Table 12

How Clinical Instructors Decide to Seek Advice

Responses	No. of Participants
Direct feedback from students	15
Student is not getting it, not retaining it (15)	
Need to solve a problem	8
Students ask questions I can't answer (4)	
Difficult student issue/situation (2)	
Couldn't teach like before due to manpower issues (1)	
Getting students from a different school (1)	
Feedback from others	6
Ask coworkers (3)	
Going to a class on teaching (2)	
Go to the education coordinator (1)	
Indirect feedback from students	2
Negative student appraisals 2	
Self-evaluation	1

Question 28 asked participants to select what types of reading materials they used to learn how to teach or be a better clinical instructor. The responses varied with no favorite reading material predominating.

Most of the respondents answered that what they do as a clinical instructor comes naturally, without thinking (Question 32). The average was 4.0; responses ranged from 1 (*Nothing comes naturally*) to 5 (*A lot comes naturally*). The results are seen in Figure 4.



How much of what a CI does comes naturally, without thinking

Figure 4

Participants listed quite a variety of things that come naturally regarding being a clinical instructor. The questionnaire gave ten examples and then asked the participants to list examples of what comes naturally. Encouraging students, demonstrating, and being patient were the three most frequently cited activities that come naturally, each being cited by 28% of the participants. Data are found in Table 13.

Table 13

Teaching Activities That Come Naturally

Activity	Response
a. Planning for instruction	3
b. Questioning students	12
c. Encouraging students	14
d. Demonstrating	14
e. Correcting student technique	7
f. Creating teaching scenarios	2
g. Modeling professionalism	5
h. Being patient	14
i. Correlating theory with practice	12
j. Evaluating students	2
All of the above	3
Other responses:	
Using visual aids, diagram	1
Covering procedures step by step	1
Being excited about the job	2
Teaching instrumentation	1
Importance of being a med tech	1
Creating teaching manuals	1
Simplifying hard topics	2
Get to know student	1
Never assume student has basic skills	1
Setting up situations for students to work their way through	2

Table 13 (continued)

Teaching Activities That Come Naturally

Using life experiences as examples	1
Changing the order of teaching/making adjustments while teaching	2
Explaining what I am doing	3
Build rapport with students	1
Being organized	2
Being enthusiastic, positive	2
Practical questions	1
Teaching techniques	1

For Question 33, over half of the participants (56%) stated that they are evaluated as a clinical instructor. Of these 28 people, 21 were evaluated by the students, 3 were evaluated by a manager or supervisor, and 2 were evaluated by both students and a manager/supervisor (2 did not specify).

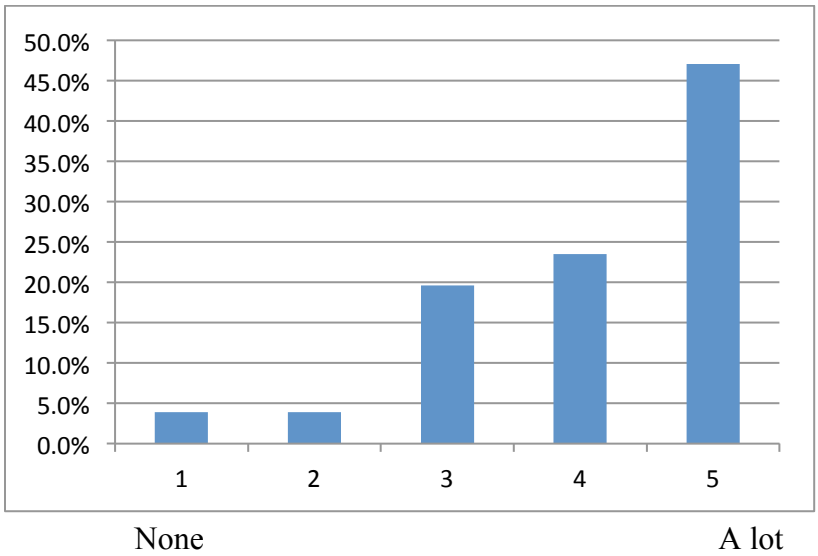
Phase 1 SubquestionTwo. The second research subquestion is, "What experiences do clinical instructors call upon to help them in learning to be clinical instructors?" Questionnaire items designed to answer this were Questions 14, 15, 16, 20, 21, 27, 29, 30, 31, 34, 35, 36, 37, and 38. Results from Questions 20, 21, 27 were reported under Subquestion One. The results for the remaining questions are given in this section.

For Question 14, 27.5% of the participants had ever taught some of the didactic/lecture part of a university program. Twenty-five percent were clinical instructors in the same university program in which they were student (Question 15). Only five participants answered yes to both

of these questions, so most of the participants who lectured in the program were doing so at the same program in which they were a student.

For Question 16, 17.6% of the participants reported that they were relieved of some work responsibilities when they had a student. This study did not address the form of this relief, for example, whether they were assigned a lighter workload or were helped with the work by co-workers. The participants in the interview phase of this research all said that they would like to be relieved of some work when they have a student.

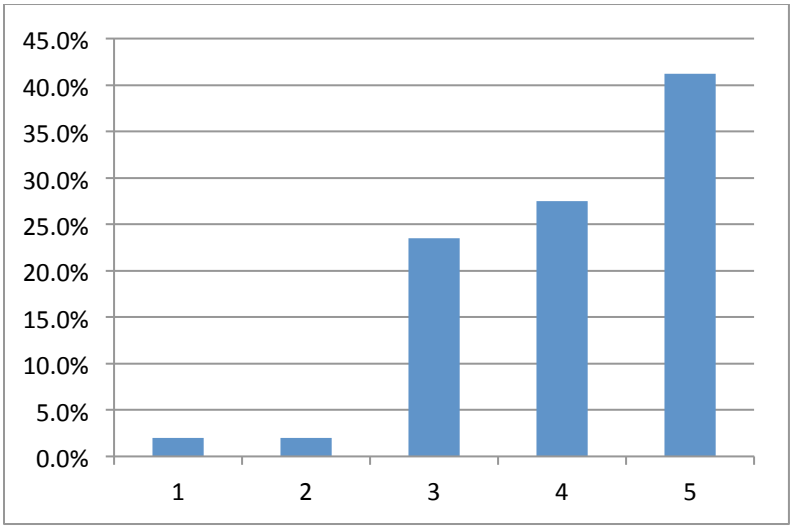
The majority of the 50 people who answered Question 29 "How much do your own experiences as a student affect your instruction?" felt that their own experiences affected their instruction a lot. The average response was 4.1 out of 5; responses ranged from 1 (*Affects none*) to 5 (*Affects a lot*). Only two people said their experiences as a student does not affect their instruction. Data are presented in Figure 5.



How Experiences as a Student Affect Instruction

Figure 5

Answers to "How much do your own experiences as an instructor affect your instruction?" (Question 30) averaged 3.9, indicating that their own experiences as an instructor very much affect their instruction. Only one person answered "*None*." Data are presented in Figure 6. Two participants did not answer this question.

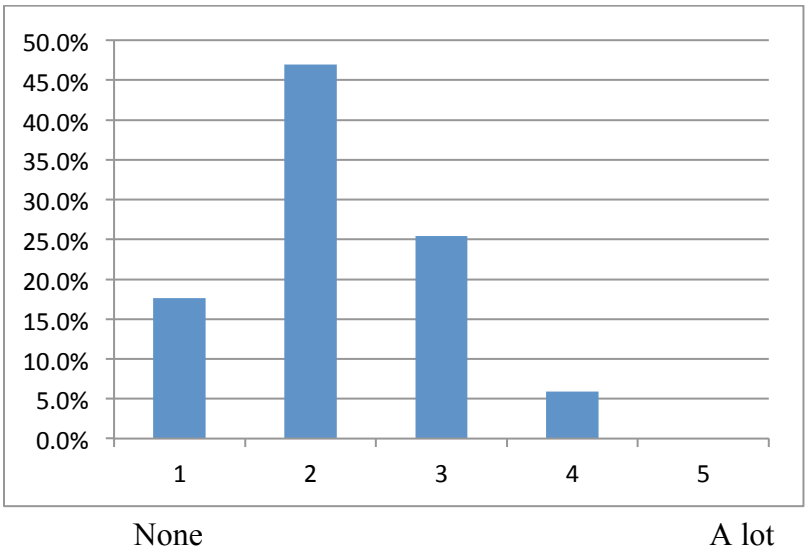


None A lot

How Experiences as an Instructor Affect Instruction

Figure 6

Most participants stated they did not have much difficulty learning to be a clinical instructor (Question 31). The average was 2.1. With the scale ranging from 1 (*No difficulty*) to 5 (*A lot of difficulty*), 18% of the participants answered 1 (*No difficulty*) and none of the participants answered 5 (*A lot of difficulty*). The results are seen in Figure 7.



Difficulty Learning to be a Clinical Instructor

Figure 7

Question 34 was an open-ended question which asked, "What difficulties have you had in learning to be a clinical instructor or learning to be a better instructor?" Six percent of the participants responded that they had not had any difficulties and one participant responded that he/she "just wings it." Other responses fell into five categories: institutional barriers, lack of teaching skills, difficulty with bench-specific teaching, knowledge, and student language barriers. Subcategories of answers in each category can be seen in Table 14.

Table 14

Difficulties Learning Clinical Instruction

Response	No. of Participants
Institutional barriers	14
Time to teach (12)	
Lack of support for instruction	
Time to prepare	
Lack of teaching skills	13
Condensing (3)	
Dealing with hostile/uninterested students (2)	
Being patient	
Explaining	
How to reinforce book knowledge	
Just need more practice	
Not comfortable “public speaking” even one-on-one	
Organizing	
Providing visual aids	
Slowing down to explain	
Difficulty with bench-specific teaching	3
Having nothing the student can do to connect it	
Rethinking why I do what I do	
Try to provide hands-on experience in some settings that aren’t as workable	
Knowledge	3
Keeping up with new methods/info (2)	
Knowing the material well enough to explain it	
Student language barriers	1

A majority of the participants (74%) answered “yes” to Question 35, “Is there anything that you need in order to do a better job of clinical instruction?” The two most frequently cited needs were help with the workload and time to teach. Responses are listed in Table 15. On participant needed a higher workload. I am pretty sure that the participant meant that he/she needed more patient samples or variety of samples so the students see a good representation of material on that bench.

Table 15

What is Needed to Do a Better Job of Clinical Instruction

Response	No. of Participants
Help with workload/time off the bench	13
Time	10
Training/class on teaching	4
Educational materials, for example from university	3
More knowledge/continuing education	3
Commitment from admin that training is valuable	2
More visual aids	1
Less stress	1
Recognition	1
Better evaluation skills	1
Patience	1
A higher workload	1
No response	5

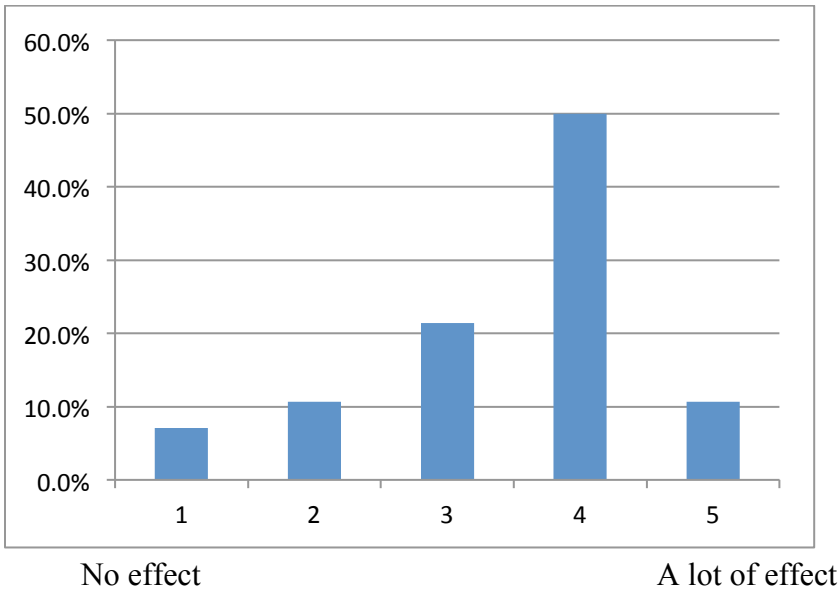
Forty-three percent of the clinical instructors participate in the development or revision of the clinical rotation (Question 36). In addition, seven of the participants who are not currently participating in developing or revising the clinical rotation said they would like to be involved in this activity. Their reasons for wanting or not wanting to participate in development or revision of the clinical rotation are listed in Table 16.

Table 16

Participation in Development/Revision of Clinical Rotation

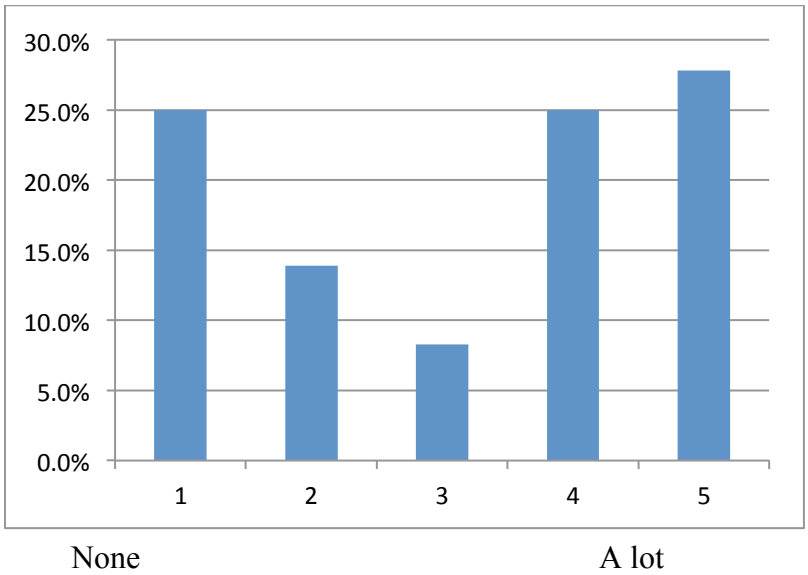
Why CI Want To Participate	Why CI Don't Want To Participate
"That way I could know what to focus on."	"I just don't have the time."
"My bench-level view of the situation is not necessarily known by management"	"Not sure what it would entail"
	"Not sure, probably NO because of time limitations"
"It would be helpful to know what the university's goals are, as well as their teaching schedule, so we could coordinate their theory with own practical teaching."	"Time constraints"
	"Because I believe the educational institution should set their guidelines"
"I'm vested and supportive of the clinical science/laboratory future & want to support future technologists"	"I would not know how to go about it"
	The med tech school adequately sets the clinical rotation for the students."
	"Not sure I'd be very much help since I have little experience with it."
	"I only want extra work if it comes with extra pay."

Almost two-thirds (63%) of the participants have had experience teaching in another setting such as a classroom, Sunday school, or Scout meeting (Question 37). When asked how much this experience affected their teaching as a clinical instructor, there was a wide range of responses, from 1 (*No effect*) to 5 (*A lot of effect*). The single largest response however was 4. The results are seen in Figure 8.



How Teaching in Another Setting Affects Teaching as a CI
Figure 8

In addition, 72.5% of the participants have helped to raise children and 23.5% have not raised children (Question 38). Four percent did not respond. The participants were divided as to how much raising children affects their teaching. Although the average answer was 3.2, the distribution of responses (seen in Figure 9) shows that people felt pretty strongly that raising children either did or did not affect their teaching; there were few responses in the middle.



How Raising Children Affects Teaching as a CI

Figure 9

Phase 1 SubquestionThree. The third research subquestion is, "What, if any, adult learning principles do clinical instructors use in learning to be clinical instructors?" Questionnaire items designed to answer this were Questions 20, 21, 24, 27, 29, 30, 31, 34, 35, and 36. Results from all of these questions were given above under Subquestions One and Two. In Chapter Five, the results for these questions will be discussed as they pertain to this subquestion.

Phase 1 Statistical Analyses. In addition to the descriptive statistics discussed above, statistical analyses such as analysis of variance (ANOVA) and chi-square were run on the questionnaire responses to the closed-ended questions. A statistician was hired to perform the statistical analysis using IBM® SPSS® Statistics version 19. The analyses were double checked by the researcher. The analyses performed are listed in Appendix E. Significance for all analyses were determined at $p = .05$. For chi-square analyses, even if an analysis came out to be

significant at p = .05, it was not considered to be significant if the expected cell count was less than five for 50% or more of the cells. Chi-square analyses are not considered to be reliable if the expected cell count in many of the cells is less than five (Gravetter & Wallnau, 2000).

The participants' ages were examined against their responses to 13 other questions using multiple single-factor analyses of variance (ANOVA). Older clinical instructors were significantly more likely to think that everyone should be instructors, $F(1,47) = 4.32$, $p = .043$. Perhaps out of a sense of fairness they think that if they had to teach, everyone should have to teach. Older clinical instructors were also significantly more likely to have changed teaching techniques, $F(1,47) = 4.28$, $p = .044$. Older people have had more time to do trial and error with different techniques, perhaps more exposure to different techniques, and the time and opportunity to change techniques.

Older clinical instructors were less likely to use their own experiences as students, $F(1,48) = 5.17$, $p = .028$, t = -2.273. As time goes on, their experiences as students fade and they probably rely more on their own experiences teaching. Yet even though older instructors have more experience teaching, they are not more likely to use their own experiences teaching, $F(1,47) = .579$, $p = .451$. Perhaps it is not that they do not use their own experiences, but rather that both older and younger clinical instructors learn from their experiences as instructors. In Figure 9 one can see that over 65% put a 4 or 5 (out of 5) as to how much participants used their own experiences as an instructor to help to learn clinical instruction. Also, naturally, older clinical instructors were more likely to have raised children, $F(1,47) = 6.69$, $p = .013$.

As only 10% of the participants were male, the chi-square analyses of gender were discarded as many of the cells had expected counts of less than 5. The chi-square test is too sensitive if cells have expected counts of less than 5. This would potentially lead to a Type I error (Gravetter & Wallnau, 2000).

Length of time in the profession showed one significant relationship. Not surprisingly, the length of time a person is in the profession is significantly correlated with the length of time they have been a clinical instructor. Once clinical instructors begin to teach, they usually continue.

The more years in the profession and the longer a person has been a clinical instructor, the less likely clinical instructors are to be teaching in the same program that they were a student, $F(7,46) = -3.06$, $p = .004$ and $F(7,45) = -3.04$, $p = .004$, respectively. After graduation many graduates are employed at the hospital where they trained, so they are likely to teach in the same program that they attended as a student. As time goes on, they are likely to move or change jobs.

Results from two other analyses for years in the profession paralleled the statistically significant results from the analysis of the age variable. Logically, increasing age will correlate with length of time in the profession if most people stay in the profession. As with increasing age, the longer a person is in the profession, the more likely that they think that everyone with their credential should be a clinical instructor, $F(7,46) = 2.34$, $p = .024$. As with increasing age, the more years in the profession and the longer a person has been a clinical instructor, the less likely a clinical instructor is to use his/her own experiences as a student, $F(8,38) = -2.48$, $p = .019$ and $F(8,36) = -2.93$, $p = .007$, respectively.

The longer a person has been a clinical instructor, the more likely the instructor is to give lectures, $F(7,45) = 4.13$, $p = .000$. Laboratorians who are more experienced on the job and more experienced teaching on the bench are likely to be asked to give lectures.

In addition, the longer a person has been a clinical instructor, the instructor is less likely to watch coworkers to learn to be a clinical instructor, $F(17,45) = -2.49$, $p = .019$. A novice clinical instructor relies on observation of other instructors as a first step in learning clinical instruction. In Phase 2, even the interviewees who did not observe an experienced instructor said that they would recommend that a new instructor do this observation. As an instructor gets more experience, they rely on techniques that they have adopted from their own experiences.

Chi-square analysis revealed that the association between number of students taught and being relieved of work is statistically significant. Clinical instructors who teach more students at one time are more likely to be relieved of work, $\chi^2 = 6.18$, $p = .046$, df 2. With more students to teach, they cannot be expected to do their regular workload. Also, the more students a clinical instructor has, the more likely they are to continue to use trial and error as a learning technique, $\chi^2 = 7.67$, $p = .022$, df 2.

Clinical instructors who are relieved of work when they have a student are more likely to be rewarded by self-satisfaction, $\chi^2 = 4.57$, $p = .033$, df 1. In addition, clinical instructors who are relieved of work are less likely to say that they get no reward as a clinical instructor, $\chi^2 = 5.00$, $p = .025$, df 1. In fact, none of the 18% who were relieved of work when they had a student selected “No reward”; they all felt they were rewarded, at least rewarded with self-satisfaction. Having help with their work when they have a student allows a clinical instructor to have more time with the student and reduces their stress. If they have some relief, they do not have to worry

as much about handling both their patient work and the student. This might allow them more time to "enjoy" teaching and feel good about themselves for doing it and doing it well.

Clinical instructors in the same program where they were students are more likely to say that they get no reward as a clinical instructor, $\chi^2 = 4.54$, $p = .033$, *df* 1. Also, clinical instructors who cited no reward were more likely to have taught in a non-hospital setting, $\chi^2 = 6.98$, $p = .008$, *df* 1. Perhaps by staying at the same hospital or a hospital affiliated with the same program they went to as students, a clinical instructor accepts teaching as part of the job and sees no reward for teaching. Likewise, by teaching in another setting, like Girl Scouts or Sunday school, clinical instructors may see their instruction at the job in a similar way –as a volunteer effort for which they expect no reward and do not see any reward. Clinical instructors who taught in another setting (e.g. scouts) were also more likely to have cited self-satisfaction as a reward, $\chi^2 = 6.10$, $p = .014$, *df* 1. This confirms that these clinical instructors are not in it for external rewards. These clinical instructors who taught in another setting were also significantly more likely to have read about how to teach, $\chi^2 = 6.32$, $p = .012$, *df* 1. All those who used reading had taught in another setting. As self-directed adult learners without any training or guidance in teaching, they sought information about how to teach.

Clinical instructors who lecture for the students (as opposed to just teaching at the bench) are more likely to continue recalling methods used to teach them as students, $\chi^2 = 4.37$, $p = .037$, *df* 1. Clinical instructors who lecture are more likely to say that they need something in order to do a better job of instruction, $\chi^2 = 7.10$, $p = .008$, *df* 1. Perhaps giving lectures causes those instructors to think more about teaching in general, including methods used by their instructors. They may also recognize that they need more resources or time than they have in order to teach better as a clinical instructor.

Clinical instructors who have raised children are less likely than those who have not raised children to think that anyone with their credentials can be a clinical instructor, $\chi^2 = 6.94$, $p = .008$, *df* 1. Of the 37 participants who had raised children, only three thought that everyone should be able to be a clinical instructor. Raising children may result in people being more aware of the importance of having good teachers. In Phase 2, participants emphasized the attribute of patience which was gained from being a parent. Also, clinical instructors who have raised children are less likely to continue to use methods used to teach them as students, $\chi^2 = 5.85$, $p = .016$, *df* 1. So although they may have used experiences as students when they first learned to teach, they do not continue to use them. Perhaps the instructors who raised children have found other methods to use through the child-rearing process.

Phase 1 Summary. In this section, the results from the 38-item questionnaire was presented, including the demographic data on the participants, the results of the quantitative questions, a summary of the data from the open-ended questions, and the results of statistical analyses. The participants' ages, years as a clinical instructor, and areas of expertise were well distributed. The majority became clinical instructors by being assigned a student to teach. The majority teaches one student at a time and do not get any relief or help with their work when they have a student. The primary reward that they get for being a clinical instructor is self-satisfaction.

The majority of participants reported little or no difficulty learning to be a clinical instructor and they felt that what they do as a clinical instructor comes naturally to them, without thinking. The extent to which they think about or reflect on being a clinical instructor varied greatly. Almost all of the participants' instruction are affected by the participants' own experiences as students and experiences as instructors, and the most helpful method used to learn

how to do clinical instruction is asking the students themselves what works the best. The participants expressed the need for more time in order to do a better job of clinical instruction, more time in general and specifically more time without bench responsibilities.

The ANOVA and chi-square analyses were mostly not statistically significant. However, statistical analyses revealed some statistically significant relationships between responses to the questionnaire items. Many of these relationships are related to age or time. For example, people who have been clinical instructors longer are less apt to use their experiences as a student to inform their teaching.

Many of the Phase 1 results are mirrored in the Phase 2 interviews. The main focus of this research, describing the lived experiences of clinical instructors, was examined through the interview phase. These results will be discussed in the next section.

Phase 2 Qualitative Interviews

In this section, texts from interviews conducted with six clinical instructors will be used to demonstrate themes discovered through the analysis described in Chapter 3. The interview guide can be found in Appendix D. Alignment of the interview questions with the research subquestions can be found in Appendix H. For the sake of this research, the pseudonyms Amy, Bonnie, Chad, Dana, Eve, and Flo will be used; their corresponding employers will be called AHOSP, BHOSP, and so forth; the universities with which they are affiliated will be called AUNIV, BUNIV, and so forth; and their education coordinators will be called ACOORD, BCOORD, and so forth. There are no correlations of these pseudonyms with the participants first or last names, place or employment, or university affiliation. Following the analysis of the written transcripts, horizonalization of meaning statements, grouping of these statements, and further reflection on the interviews, six major themes emerged. An example of horizonalization

can be found in Appendix I, the grouped horizons for the same participant can be found in Appendix J. Combined grouped horizons for all six participants can be found in Appendix K, and meaning units derived from this can be found in Appendix L.

Phase 2 Emergent Themes. Analysis of the interviews from the six participants in Phase 2 began as soon as each was transcribed. Each was read in its entirety and a description of each interview was written. This description was sent to the interviewee to check for accuracy. For each transcript, horizonalization was done; that is, statements (horizons) were identified that might be meaningful for the research. An example of horizonalization can be found in Appendix I. The statements/horizons were read and reread and comments were made in the "Comments" column. The statements were categorized according to their applicability to the research subquestions and several other potential themes. An example of this categorization/grouping is seen in Appendix J. Next these individual statements were combined with those of the other interviews. An example of this can be seen in Appendix K. These combined data were then organized into meaning units, preliminary themes which can be seen in Appendix L.

At this point I reread all of the transcripts again and tried to come up with alternate explanations for the data. Finally, the meaning units were analyzed and themes were extracted. The six major themes are, (1) clinical instructors use experience as a learning resource, (2) clinical instructors learn in order to solve a problem, (3) clinical instructors use a variety of methods to learn how to conduct clinical instruction, (4) some clinical instructors have a natural ability for teaching but some do not, (5) clinical instructors must learn to teach with less time, and (6) clinical instructors vary in their self-directedness and internal motivation. Themes and subthemes are found in Table 17.

Table 17

Themes and Subthemes

Themes and Subthemes
1. Clinical instructors (CI) use experience as a learning resource.
a. CI inform their teaching with experiences they had as a student or trainee, good and bad experiences.
b. CI learn to teach through life experience and parenting.
c. CI learn to teach through job experience.
2. CI learn in order to solve problems and they apply their learning for immediate use.
3. CI use a variety of methods to learn how to do clinical instruction.
a. It would be helpful to observe a good CI at the beginning.
b. CI learn to teach through trial and error, e.g. making mistakes.
c. CI learn to teach by teaching.
i. CI learn to individualize instruction through experience.
ii. CI learn that students learn better by doing the bench activities for themselves rather than just observing.
4. Some CI have a natural ability for teaching but some do not
5. CI must learn to teach with less time.
6. CI vary in their self-directedness and internal motivation.

CI = clinical instructors

Two "group" interviews were done in this research as described in Chapter 3. This resulted in some very good discussions back and forth between the participants. As I had hoped, the interaction of the participants stimulated the thinking and memory of each participant, leading to a more complete picture of their experiences. Some of these give-and-take discussions are included in this chapter to illustrate some invariant themes found in this research.

Major theme 1: Use experience. The first theme is that clinical instructors use experience as a learning resource. Participant A, Amy, said it best, "Every student probably teaches you something." Subthemes are (a) experiences clinical instructors had as a student or trainee inform their teaching, (b) clinical instructors learn to teach through life experience and parenting, and (c) clinical instructors learn to teach through job experience. In Chapter 5, I will discuss how this is an assumption of adult learning.

Experiences as students. Almost all of the interviewees stated that their instruction was influenced by their own experiences as students, especially their experience as medical laboratory science/medical technology students. The clinical instructors drew on this experience as they learned to conduct clinical instruction themselves. The participants took lessons from their own instructors, both positive lessons and negative lessons. On the positive side, Chad said:

> I picked, I guess, the way I was taught, I picked the best ways that I felt I learned by other teachers, instructors and even on the job training. Things that seemed a positive experience for me and how I learned better than from other clinical instructors. I just took those, I guess, qualities and put them in the way I teach.

Yet, Chad also learned from some poor instructors:

> I feel yes that I think from the example of being a student and the different instructors I've had that I just try to pick from my experience as a student what I thought what qualities these instructors had that I felt I might impose and, and, you're right, I've had some bad instructors too that could be intimidating. I think that's the worst thing you can do to a student is to intimidate them or make them feel afraid to ask a question, or afraid that they're going to make a mistake and they're gonna feel major repercussions if they don't do everything perfect. And so I, I try to make them relax and feel like, you know, I'm on their side and, you know, they're probably going to make a mistake and it's not a big deal, you know, it can be fixed. Just try to put them at ease where they feel comfortable, they don't feel intimidated or uncomfortable. And I think that's, that's one of the biggest qualities of being a teacher is the ability to put your student at ease so they feel comfortable.

Dana had good instructors, saying, "I think back to when I was a student and try to go from there." Later she added:

> My experience was so good, I was like, this is how I want to train students, you know, I want to share that same experience. Cause for the exact opposite reasons [as Eve], but the same drive cause my experience was so good. I can't say enough-it was really a great experience.

Amy, Bonnie, Eve, and Flo all had mostly negative experiences with their clinical instructors and are determined not to be like them. Amy said, "I had one clinical instructor I did not care for. And I've tried not to be like [her]." Bonnie discussed her experiences:

> They were in the wings if we needed them, most of them, but after a couple days we were expected to run the bench, and if you didn't, you were made to feel that you were very unsuccessful and you'd better do it and learn it quickly or you would be getting the brow beat and you will be the topic of the lunchtime table and yeah, yeah, I had some instructors that really didn't teach, they just showed you and you did it. So I vowed that if I ever got the opportunity to teach that I would show a little more empathy for my students and I would actually be a little more hands on…. And I believe from my experience as a student, I knew at that point I didn't want to be treated that way, I didn't want to treat anyone that way so therefore I adjusted the way I taught along with the culture.

Eve and Flo had very similar bad experiences as students. They felt that their clinical instructors did not want them around and did not want to teach them. As Eve said:

> Very much so [my experience as a student affects my teaching]. I had to kind of get the information out of the techs, you know, felt very unwanted, very not hands on, very left in a corner, kind of feeling when I went to school, so you really had to ask to learn, so very unwanted, I felt very unwanted at the time.

Flo explained:

> I did not have good classroom teachers or good bench teachers there. They weren't interested in bothering with students. I didn't want to see myself, so that's a lot the way I

> feel about teaching." And a little later she added, "So at the time it wasn't a very good experience. Now looking back on it, I can't imagine training students like that.

Life experience. The second subtheme where clinical instructors use experiences to learn to conduct clinical instruction is learning to teach through life experience and parenting. Flo explained that life experience makes her teaching better, "Life experience, I think, because it depends on how you feel about you and yourself and what's going on as to what you are going to put into your teaching."

Dana and Eve discussed how they came to know the things that came naturally. Dana said, "Being a mom!" Eve added, "Yeah." Dana continued, "I really do, I think that has a lot to do with it I do. If you have a child or involved with children, age, experience, age and experience." Eve added, "Teaching my own kids." On using life experience and parenting experience, Chad said,

> I think in life in general, you're training, you're teaching all the time, I mean especially if you have children, you teach your kids, you know. So I think I've learned, you know, cause I have a daughter, just teaching her how to read and things like that, ride a bike, just explaining everything to your kids, I think you evolve.

Job experience. The third subtheme where clinical instructors use experiences to learn to conduct clinical instruction is learning to teach through job experience. Dana said:

> I think the more confident you get with your job and the more comfortable where you work, especially if you've been at a hospital for a while just a short while, it's hard for you to feel comfortable as well, especially with different instrumentation. I think just that comfort and that confidence and that patience makes all the difference.

Clinical instructors also learn the content that they need to teach through job experience.

As Flo said, “Job experience of course is going to make you a better teacher because then you’re gonna have more knowledge to pass on.” On the job, they learn more than “book learning,” such as setting priorities and the connection of the theory learned at the university with the job. When she started as a clinical instructor, Amy said that she was prepared regarding the knowledge that she needed to teach from experience on the job as well as from knowledge recalled from her time as a student. She said,

> Not really prepared in the teaching aspect. Prepared in the knowledge I think, hematology knowledge, because I hadn’t been out of school that long. Had learned new things here at AHOSP, so I would say prepared in knowledge, not really prepared in how to go about it. I just started.

Major theme 2: Learn to solve problems. The second major theme is that clinical instructors learn in order to solve problems and they apply their learning for immediate use. This is another adult learning assumption that will be discussed in Chapter 5. The participants discussed several ways that they learned in order to solve a problem.

One way to learn to solve a problem was to seek advice from someone. Especially when she was new to teaching, Amy would go to the education coordinator for help. The fact that she doesn’t need to seek advice as often now shows that she has learned to cope with these situations herself. Amy said:

> When I was having an issue, especially more in younger years, I wouldn’t have a clue what to do. And I would say, well once I caught a student cheating and I didn’t know what to do really, so I went right to her and told her everything. I guess when I just feel like the student is out of control, either in that type of an instance when there was

> cheating or when their grades are poor and I have done all I can and given extra materials, extra slides in the case of hemo, nothing's working.

Dana sought advice with student attitude problems. As she said:

> I think the only time I've had that [the need to seek advice] is when I had a student who didn't seem to care. Wasn't a lack of a lack of knowledge or lack of effort, it was just not interested, didn't care. Then I went to somebody I don't know what to do here. How do I get somebody to learn that doesn't want to learn.

Eve said, "If the student's not understanding, you know you can tell if they're not understanding it Then maybe you have to re-explain it to them or word it in a different way, go back over it again." So she has learned to explain things differently.

Early in her teaching career, Flo changed her teaching for practical reasons, to make it better for both herself and the students. In order to solve a situation that was not optimal, she changed her teaching. She did not know how to teach at the beginning, but she realized that what she had could be improved. She said that she changed, "Because I think it was easier for me plus I think some of it worked better for my students."

Major theme 3: Variety of methods. The third major theme is that clinical instructors use a variety of methods to learn how to conduct clinical instruction. Subthemes include (a) the helpfulness of observing a good clinical instructor at the beginning of a clinical instructor's career in clinical instruction; (b) learning to teach through trial and error, e.g. by making mistakes; (c) learning to teach by teaching; (d) learning to individualize instruction; and (e) learning that students learn better by doing the bench activities for themselves. One method that was not used by the participants was doing continuing education to improve their teaching, although they all do continuing education in their content area. Also, most participants have not

taken a formal course or training on teaching or clinical instruction. The variety of methods used to learn clinical instruction was also seen in the responses to Question 23 of the questionnaire. Six participants added "other" methods to the eight choices listed in the question. So, quite a variety of methods are used to learn clinical instruction.

Observation. Most of the participants thought it was a good idea to start to learn clinical instruction by observing a clinical instructor in action with a student. Watching a good instructor is helpful, especially if the instructor is teaching the bench that the observer will be teaching. Some of the interviewees had observed a clinical instructor in action (besides the "observation" of clinical instructors that they did as students). Bonnie said, "When I really started teaching is when I observed other teachers and I pulled out the procedure and went step by step through the procedure." And she suggests how to help a new clinical instructor, "I would put them with a good instructor so they could observe the way it's done here on a certain bench, especially if that's a bench they could possibly train on the future." Flo wishes that as a new clinical instructor she could have observed a good instructor in action:

> Looking back, I wish now that maybe I could have watched someone in blood bank, you know, what they did in a day, a day here or there. I'm not saying that I would do exactly what they're doing, but you know at that point I had no clue. So it might have been nice to sit in with somebody and say "What are you going to do? What's your plan?" Or "What do you normally do?" That might be nice. Like I said, you might teach totally different than how I teach but yet we might be able to bring some things together in the middle, so you know if you said "on day A, I do blah blah blah" and I might say, "Well what about this?" and then you go from there. But when you don't know what anyone

> else is doing, you are kind of building it on your own. It might have been nice to see what was going on at the time.

For new clinical instructors Dana suggests, "I'd have them job shadow somebody who's a good instructor so they can get an idea of what is a good way to go about it." Amy also suggests observation followed by immersion, "Maybe watching a little how other instructors instruct in this setting and then throw them in."

Trial and error. Trial and error is another method that was frequently mentioned or alluded to by the participants as a way they learned to do clinical instruction. As they tried different ways of teaching, they learned what worked best for themselves as instructors. They also learned what worked best for different types of students. Chad said,

> I think that, you know, teaching over the years I have evolved and I learned just from trial and error and um how the students respond. I guess because I teach the same bench too, you know, mainly two different benches, so I think that for every student I probably tweak a little bit um just from learning how they catch on. It's like you get more and more experience at it, it helps you become a better teacher.

Bonnie and Chad must have been talking before the interview because Bonnie referred to something Chad had said about riding a bicycle:

> I like your analogy with riding a bike. I do, I think it's so true. It's so, so, somebody describes it to you and you just have to hop on and start peddling and the more you do it, by trial and error, the better you are. You learn to weave around the pot holes, and skip the curbs, and you know you just find new ways of making a better experience happen.

Dana said, “I always learn from my mistakes. I try to never make them a second time. I think that’s a huge part for anybody learning. That’s more of a teaching tool unfortunately than anything else.” Flo also explained that she learns from trial and error:

> I don’t really think about it, but I think sometimes if there’s a technique that I’ve decided hey that really worked with this student, you know what I mean, there’s something I showed them or some sort of example or something I’ve come across, I’ll use that the next time.

Learning to teach by teaching. Clinical instructors said that they learn by doing; they learn how to conduct clinical instruction by doing clinical instruction. As Chad said, “I think you learn the more students you train. You evolve and you become more comfortable, what to say, what they respond to. So it’s a constant learning process. Every student is different and individual.” Later he added, “I think that I’ve evolved; anything you do the longer you do it the better you get at it.”

Eve said, “Well I think with anything you improve with time, you know you’re gonna improve with time.” Dana agreed, “I think you gain confidence in your ability to teach somebody, in the beginning you’re like “Oh, where do I start, I don’t want you know to go too basic, I don’t want to go over their head.” Eve responded, “Yeah, I think you get that confidence, you get that pattern.”

Amy explained how much she thinks about or reflects on teaching, revealing how she learns from teaching and trial and error:

> I could tell if students retained by me questioning them on things they should know. And I would realize the things they did not retain um I needed to make them repeat several times, needed to find a way to make them remember and then after that a way to associate

> what they remembered with what they would see. So it was a trial and error. I would put it in that area. Um, some students always pick things up quickly, but you learn the most on how to teach, I think, from the ones that do not.

Besides showing that Amy learns from teaching and trial and error, this example also shows that she used these experiences to solve an immediate problem: the student was not retaining the instruction. So this example is also an example of the second major theme, clinical instructors learn in order to solve problems.

Individualizing instruction. Many of the participants mentioned that they had learned to identify different individual student needs and ways of learning. Having identified each student's needs and way(s) of learning, clinical instructor then knows how to approach instruction for that student. They learned how to do this from the experience of teaching students; what works for some students may not work for others. A discussion between Bonnie and Chad illustrates this subtheme. Chad said, "Every student is different and individual, you know." Bonnie said, "You learn, yeah." Chad continued, "You teach students a little bit differently." Bonnie picked up on this, "After the first couple hours with them, you get the idea, yeah, how to relate to that student, just by asking open-ended questions." Later Chad explained:

> You need to be flexible with each student, and some learn quicker than others so if they're catching on quicker you can cover more material than others which are slower so you need to constantly revamp, you know you have a certain time frame, you know, three days, four days on this bench so depending what pace they're progressing, you can give them more information.

Flo explained that she reflects on her teaching in order to optimize instruction for individual students:

> It's driven by if I have to work harder with them because that kind of depends on how I you know I like to teach them. You know, are they visual, do they need a lot of practice, do they need more for me to talk them through things, do they need me to hover over them or leave them alone. So sometimes it might take me figure out how to read your student and go from there how I'm gonna teach them. Sometimes it's easy, I teach here and I'm fine and I don't think about it too much, other times I might go home and think "Oh God, what can I do to help them to make them have a better time, where it's gonna be easier for them."

Amy also explained that she gives more material and assignments or less extra stuff depending on how each student is doing. She said, "That's a case by case thing."

Having students perform bench themselves. Showing students how to do the job, how to run each bench, each area of the lab, is the major responsibility of clinical instructors. Many clinical instructors do this by first showing the student how it is done and then having the student perform it the next day. Some clinical instructors do not let the students perform it themselves at all because letting them do anything would slow down the process of getting laboratory results to health care providers. However, many of the interview participants in this research firmly believe that letting the students actually perform the laboratory work immediately helps the students learn better. Direct supervision is implied by these participants; they do not let the students just

go ahead on their own. Many students (and the clinical instructors too) are kinesthetic learners; they learn best by doing. As Chad said:

> I've always taught by making the student do everything themselves, or trying to talk them through whatever processes I'm training them on. So I think students learn a lot faster and a lot better when they're hands on rather just observing me all day or sitting there. So I'm very much, like you know I'll say "Press the start button" but I won't I won't press the start button, I'll make them. Every little thing that we have to do, I make them do it. So, because then I think they really have to focus and concentrate on what they're doing, but if they're just watching you do everything, they could, their mind could wander or they start thinking about something else because they're not having to focus as much.

Chad learned some things about teaching from the person who trained him on his first job out of school. He explained:

> One thing that she said that always stuck in my mind, she said is to put your hands behind your back, in other words, make them do it. You know, explain it but don't do it for them. And that really stuck in my head. I think you do learn so much faster and better when you actually have to do it.

Dana has also learned that having students jump right in and do the bench is a good way to teach the bench. She said:

> They're working alongside you, learning alongside of you, cause I suppose because of my skills as a hands on learner much more than reading a book. So me, I tend to teach that way cause that's what works for me. I think a lot of students appreciate that cause some people, like you can't touch anything for the first so many days, and I think

> "Ahhh", you know, it's hard to gain that interest. I think I've probably changed to more of that, let's just jump in feet first.

Major theme 4: Natural ability. The fourth theme is that some clinical instructors have a natural ability for teaching but some do not. There are mixed opinions about whether only the good teachers should teach however. A discussion between Bonnie and Chad illustrates this. They were explaining to me why every tech (laboratorian) does not teach in their hospital. Bonnie said: "Some people just don't have the patience that's required. They're good techs, they're fabulous as techs and they know what they're doing, they just don't have the patience, they don't want to take the time to relearn the theory. I don't know, you talk to them, Chad." Chad picked up on this, "And some people are just not good at teaching or explaining. They're good techs and they know their job very very well but I work with some people that just can't seem to clarify just what they're trying to teach them." "They can't verbalize," added Bonnie. Chad continued, "They make it confusing or you know they confuse the student. So I think it takes a certain personality or an ability to explain. I think it's almost a natural born thing, I think it is." Bonnie agreed, saying:

> I think it is. I think you can learn it to a certain extent if you have to but it doesn't mean you're very good at it. I think the better ones just have an innate ability to explain things better, and, um, there are some people that just can't explain it, they can't verbalize, they can't put it into an understandable format.

Bonnie explained that people who cannot teach well know it and don't want to teach:

> You know I've had people come to me and say "I don't teach well and I know I don't teach well so please don't give me students." So I kind of think that after you've tried it a few times, you kind of know whether you're a good instructor or not or can handle all the

> facets of it. So, you know, I think you take yourself off that track pretty early in your career unless you're forced to do it like some places force their people to do it."

So, some people cannot teach well. On the other hand, some people, some clinical instructors, have natural teaching ability. Chad said, "I think some people are just natural-born teachers, they explain well, they, they put their student at ease and other people are just bad at it." Eve said, "I think some of us just have a natural talent for it and some don't."

Flo thinks that teaching comes naturally to some people. As she said, "Yes. I do. But I also think there's a lot of techs here that aren't, even though they have the same credentials and could be really good techs aren't very good teachers. Later she added, "Just because you could [teach] doesn't mean you should." But not everything comes naturally, as she said, "Sometimes going over their mistakes and correcting them. Sometimes that's hard." Amy said that teaching comes naturally to her:

> It comes fairly naturally to me and I know some of the girls have a very hard time talking through what they are doing. I always felt it was rather natural to talk and show when I have something strange on my scope, I'll say something, student or not.

For Amy, it is natural to show and explain things to anybody, not just students.

Major theme 5: Less time to teach. The fifth theme is that clinical instructors must learn to teach with less time. The health care system has been trying to cut costs since the 1980's, and, as a result, health care professionals are pressed for higher and higher productivity. This has left less and less time for health care professionals, including medical laboratorians, to teach students. Amy, who has been teaching for over 20 years, said that what she teaches has not changed that much, but the time that clinical instructors have to teach has changed. Clinical instructors have less time to teach because they are expected to do more bench work on patients.

Amy said:

> [I teach] the same material. The only difference is I think of how to do it while I'm working because we no longer have a lot of time that you're not also working on patients, so you're working and showing at the same time.

Chad explained that trying to do both jobs, the bench and teaching, is difficult:

> A lot of employees don't want to be bothered with teaching, and it is more difficult, especially if you're trying to the bench on top, and you know, it slows you down so much to have to explain everything you're doing and answer questions and things rather than just focus on your job. So a lot of people don't want, don't really want, to be bothered with it.

When asked how her teaching technique had changed Bonnie said:

> Less reading the procedure [to the students], more having them read it on a side and then you accomplishing some tasks while they're doing that because you know less through the years you have less people to work with you , so you've had to multitask to a certain extent, to the point where in the 80's and 90's it was "see one, do one" for the students. Remember that? And then we got a little beefy in the 90's and the early millennium we got a little beefy so we could be off the benches and have that luxury, I think, of really doing an excellent job of teaching. And then we got streamlined again and so we had to see one, do one. So, you know, it kind of depends on the economy of the hospital and the staffing resources that you have as to how you adapt your teaching, unfortunately, on the bench.

Chad responded:

> Yeah, I agree. It's difficult when you have to work the bench and teach at the same time

> and I think the student ultimately suffers because you just don't have the time to explain so you might put them off in a corner and have them work almost by themselves with the procedure and I hate to do that. I like to focus on them and not have to keep up with everything. So it's really beneficial when I have another tech, you know, on my bench that can cover the actual workload so I can pick and choose what I am going to show them and not worry about it.

Flo used a situation from the day that we spoke to explain how difficult it can be to be busy on the bench while you have a student:

> Like today I was in blood bank, I was the only tech. If I'd have had a student, they wouldn't have learned a lot. I'm pretty up front about that in my rotations. If we have patient work, you're going to be pushed to the side. I will try to find you something to do but I can't promise if I'm occupied. Um, I wish it could be easier.

She added, "That's how it's going to be, it's not going to change, it's not going to get better." Later she described it further, "Sometimes it's hard when you're busy and you're trying to thin yourself out to everything. You've got to remember to be patient with everyone and try, you know, to teach students plus get your work done." She further explained the consequences of having to choose between doing the bench work and teaching the student:

> If you [just] had another person in blood bank, I mean no one's going to be able to fulfill that, but sometimes trying to teach and trying to do your work you are going to short something and you don't want to short the patient.

Major theme 6: Self-directedness. The sixth theme is that clinical instructors vary in their self-directedness and internal motivation, some are very motivated and some are equivocal. In Chapter 5 I will discuss how this is also an assumption of adult learning. Chad said:

> I take it very seriously because I feel the students, I mean they're paying good money to come here and train, so I take it very seriously, I think about it a lot. I'm always trying to think of better ways to explain the bench to them."

Bonnie took the initiative to study on her own when she started teaching. She said, "I was intimidated by students' questions as well. Because then that had to draw on my theory bank so I did a lot of self study."

Amy was always interested in teaching and when she ended up at a hospital that had students, she took the initiative to learn how to teach by watching the clinical instructor. She helped teach a little and when the instructor left, she took on the whole responsibility for teaching hematology. As she explains,

> I wanted to help teach after I first came here as a tech and I was lucky enough to come to a teaching hospital and in the hematology department. So I watched a girl that taught some and just took part of it from her and started teaching, actually red cell diseases, talking through the disease and showing the slides at the same time. That was my beginning.

Amy has continued to be a self-directed learner. As she said, "If you care, teach, care about what you teach, you'll continue and better yourself."

Explaining how she knows how to teach, Eve said, "And if you really want to do it, too. If you feel inspired to teach." Dana responded, "I agree with that. I think if you don't feel like 'Oh God, this is just another, you know, responsibility now' versus I'm going to help somebody

get in the field and try to get them excited." Eve responded, "Yeah, and you kind of look forward to sharing that with people."

Flo explained that she did not get any help learning clinical instruction, "So I think I kind of self-taught, in a way, and hopefully worked out from there." Her motivation for teaching is internal, as she said, "You know, yeah, I can put it on my resume and on my evaluation that I teach, but I like teaching."

In spite of these comments which lead you to think that these participants are self-directed and motivated instructors, several also indicated that they did not do much, if anything, to improve as instructors. Eve said, "I probably don't put a lot of thought or energy into [teaching]. I kind of go with the flow and bring the student with me." Both Amy and Flo denied doing any self-evaluation, even informally. When asked how she becomes a better instructor, Flo said, "I don't really think about it." However, when she was pressed, asked if she did informal evaluation for herself, Amy said, "I think I do. When a student is about done I will usually talk to them and say, 'Is there anything else you need?' "

Phase 2 Thick rich description. The end product of the Phase 2 data is a thick rich description of the experience of medical laboratory science clinical instructors learning to conduct clinical instruction. To make it more real, I have named the clinical instructor in the description "Sue." This is not a real person and the experience described is not the experience of a specific person, but rather, it is a compilation of the data, the participants own words, and the insights that I gained through the research process. Of the five participants who read and

critiqued the following thick, rich description, all recognized their own experience in this description, saying, “This could have been me.” The thick rich description follows:

> Sue graduated from a university program in medical laboratory science and was employed even before she graduated. Her first job was working in a hospital laboratory on the evening shift. Shortly after graduation she took the national American Society for Clinical Pathology examination to become certified as a medical laboratory scientist (MLS). On evening shift, she was a generalist working in most of the departments including clinical chemistry, hematology, and blood bank, but very little microbiology. After four years, she moved to day shift in the hematology department and cross trained in the chemistry department automation section.
>
> Students rotate through each department on day shift, so Sue had nothing to do with the students until she went to day shift. Even though teaching is in everybody’s job description, the students at her hospital are generally placed with techs (laboratorians) who have expressed a willingness to teach and seem to be good at it, in the opinion of the education coordinator and lab manager. However, they are not compensated by the hospital or university for teaching. Sue feels that the only reward she gets from teaching is self-satisfaction. She realizes that with the shortage of laboratorians and upcoming retirements that it is important that they teach students.
>
> Arriving at 6:30 AM, Sue’s day on the bench begins by seeing that the hematology instrument and work station are ready. Blood specimens arrive throughout the day and need to be processed and run so that health care providers get the results as soon as possible, usually within a couple of hours. Periodically “stat” specimens arrive from the emergency department or intensive care. Sue interrupts her highly organized

work to run these urgent specimens and calls the results to the doctor or nurse's station. During the day, her work gets interrupted by phone calls from health care personnel asking for results or asking other questions. Sue's ability to multitask and her organizational skills help her from being overwhelmed by a workload that has just seemed to increase and increase over the years. Typically she takes a 30-minute lunch break and may or may not get her morning and afternoon breaks. She plans so that at the end of her shift she can be finished with whatever she is working on. Sometimes she hands off some work to the person coming in for the evening shift. All of this day's work is what she will need to learn to teach to a student.

Having a student or two to this situation adds more stress to an already stressful job. Sue really cares about providing an accurate and meaningful laboratory result to the health care provider so that the provider can make the best decisions possible about the patient's diagnosis, prognosis, and treatment. Patient work is her priority; students are squeezed in around her patient work. She is not relieved of any work when she has students and usually her coworkers are too busy to help her. For some benches, the work itself makes it difficult for someone else to help. Students themselves are little or no help as they are just learning the bench and do not contribute to productivity. A student actually slows down the work because Sue needs to explain what is being done or oversee the student as he does the work. So she needs to learn not only how to teach the student the bench and the job, but she needs to learn how to juggle her bench work and teach the student at the same time.

Before she teaches, Sue needs to know what she is doing, why she is doing it, and what the results mean in order to teach it to a student. Sue feels comfortable enough doing the bench to teach it. Although she has only worked on day shift for nine months, she has worked in the lab for almost five years. Other than that, she has not done any preparation to be a clinical instructor and no orientation to teaching is provided. There are no formal requirements to be a clinical instructor. In Sue's hospital, most of the clinical instructors are certified MLS but a few veteran laboratory technicians are also clinical instructors.

The education coordinator, the liaison between the hospital and the university, schedules students to go through all of the benches in the departments. After Sue has been on day shift for about 9 months, she sees on the schedule that a student will be on her bench next month. She has not thought much about teaching until the schedule was posted and now she is a little nervous to get her first student. She begins to observe other clinical instructors as they teach. She knows that she is supposed to show the student the bench were she will be working but she gets more details about what is expected of her by talking with the education coordinator and looking over the university checklists and daily schedule provided by the coordinator. She recalls what her clinical instructors did when she was a student. She will try to be like her good instructors, but she especially will try not to be like her bad clinical instructors who acted as if they resented the students' presence. She remembers feeling frustrated and unwanted and she vows not to have her students feel this way.

When her first student arrives, Sue welcomes him and shows him where to put his things. Then she dives right in, showing the student what she is doing on the bench and

how she is doing it. She reminds herself to go slower. At the end of the day she asks, “Do you understand?” The student says, “Yes,” but he says to himself, “Yikes, I am completely overwhelmed. Am I expected to remember how to do all that?” That evening before she falls asleep, the clinical instructor thinks, “Did I remember to show him how to print out a result? I should show him the tutorial on the instrument tomorrow.”

As the rotation progresses, Sue follows the teaching schedule and checklist to know what to cover each day. She discovers that explaining things comes naturally to her. If the student has a puzzled look, she is pretty good at rephrasing what she is saying. On day 4, however, a coworker does not come in because of a sick child and Sue needs to perform her own work plus some of the work on another bench. She just does not have time to show the student anything. She explains this to the student when he comes in at 7:30 and sends him to the back room to study. She checks on him around 12:30. He seems really sleepy, so she asks him to cut some Parafilm, a little chore to help them out. A coworker suggests that he go observe in the histology department if he wants to and if they can take him. He comes back half an hour later saying that they are too busy. So Sue tells him he can go home early.

Sue is scheduled to be off on the student’s sixth day in the rotation because she is going to be working the next weekend. She tells the coworker who is going to have the student the next day that she has not done sed rates yet with the student because of the busy day on Day 4. So she asks the coworker to do that with the student even though it is not on the schedule for Day 6.

In the middle of the rotation the education coordinator reminds Sue that she will need to give the student a practical test. She will also need to fill out an evaluation of the

student. Sue goes over the guidelines for the practical which involves observing the student run the instrument for a certain period of time, looking for certain things. She is also supposed to select samples with problems that the student should recognize, like hemolysis. This seems fine with Sue until during the practical, the student does something wrong that was not on the evaluation sheet. She notes it and asks a coworker what she should do. The coworker says that this has never happened before. The education coordinator just tells her to use her best judgment. Sue goes back to work and will decide later. By the end of her first student's rotation, both she and the student survive and he has actually learned a lot about how to do her bench and a lot about how the lab works.

As the years go by, Sue continues to learn how to conduct clinical instruction better through experience, especially how to individualize her instruction. Through trial and error, especially in problem situations, she learns different approaches to use for different students. She has collected some articles to give to the students who seem to learn best by reading. She has identified some additional activities for students who are quick learners and have extra time. She has some activities that students can do independently when she is too busy to teach.

She uses open-ended questions more than she used to so students have to explain things back to her so she can see if they understand. She has the students perform the lab work themselves as much as possible; however she occasionally just has the students watch her when she is busy. She pushes reluctant students to jump in and perform the work, reassuring them that she is right there and she won't let them make a mistake. She has learned where students have trouble or where they often forget knowledge from their

university courses, and she has developed a way to deal with these areas. After seeing many students and with increasing maturity in general, she is more patient and less reactive when a student makes a mistake.

She consults the education coordinator only when she has a problem, and she lets the education coordinator deal with students' tardiness or other troubles. She seldom thinks back to her own days as a student any more. The techs in the lab do not talk much about teaching except for occasionally complaining about the problem students. She tries to deal with poorly motivated students by emphasizing how important lab professionals are to health care. She also reminds them that this experience also serves as a job interview for them, so if they want a job or a good reference, they had better come in on time and have a better attitude. The students' behavior and demeanor will then improve for about a day or two.

Sue does continuing education because it is required by the hospital. Almost all of it is in hematology and instrumentation. She does not feel a need to participate in continuing education about teaching because she feels comfortable teaching. At the university the students do evaluations on her teaching or at least on her department's teaching. Since she seldom hears back about her teaching, she assumes that she is doing a good job because she hears that the students are passing the certification exam.

Sue does the best she can under the circumstances. Students will learn the rest when they get a job. She hopes the lab will hire the students when they graduate. She still likes to teach but wishes she had less to do on the bench so she could spend more time with the students and perhaps spend more time going over case studies.

Comparison of Phase 1 and Phase 2 Results

Data from the questionnaire participants and the interviewees are very similar for almost all questions. This is not necessarily expected because the interviewees were not selected randomly but purposively. One of the largest differences between the questionnaire participants on the whole and the six interviewees is that 82% of the questionnaire participants have used trial and error as a method of learning to conduct clinical instruction and 100% of the interviewees have used trial and error. Perhaps clinical instructors who are more interested in education, those who volunteered to be interviewed, are more likely to use active learning strategies such as trial and error. The interviewees also used their experience as instructors to learn how to conduct clinical instruction more than the participants as a whole. Susi (2010) found that people who have been doing clinical instruction for a while tend to rely on their own experience teaching and use their experience as students less than novice clinical instructors do. However, even though the interviewees in this research were experienced instructors, their amount of experience did not differ from the participants as a whole. The interviewees did report that they reflected more about being a clinical instructor than the participants as a whole, interviewees averaging 4.0 against the overall average of 3.2 (1 being reflects “never”, 5 being reflects “even when I am not teaching”).

Another difference is that only 56% of the questionnaire participants reported being evaluated as instructors, whereas on their questionnaire five of the six interviewees reported being evaluated and all six reported being evaluated during the interview. Also, all six interviewees have raised children, whereas only 73% of the overall participants have raised children. It is difficult and inappropriate to do more than speculate about cause and effect from a questionnaire. Although these differences are interesting and may be real, it is in the depth of the

interview data where glimpses of real understanding about the learning of clinical instructors are seen.

Chapter 4 Summary

This chapter presented the results of the quantitative Phase 1 and the qualitative Phase 2. This two-phase research was designed to elucidate the experiences of clinical instructors of medical laboratory science students as the clinical instructors learn to conduct clinical instruction.

In Phase 1, the results of 51 questionnaires were presented. These results represented the experiences and opinions of clinical instructors from hospital affiliates of six Midwest universities. The majority of participants reported little or no difficulty learning to be a clinical instructor and they felt that what they do as a clinical instructor comes naturally to them, without thinking. The extent to which they think about or reflect on being a clinical instructor varied greatly. Almost all of the participants' instructional efforts are affected by the participants' own experiences as students and experiences as instructors, and the most helpful method used to learn how to conduct clinical instruction is asking the students themselves what works the best. The participants expressed the need for more time in order to do a better job of clinical instruction, more time in general and specifically more time without bench responsibilities.

In Phase 2, the results of interviews with six clinical instructors from four hospital affiliates of three Midwest universities were presented. Analysis of each transcript was performed, after which the results of all transcript analyses were combined. At each step, the analyses were checked by the participants or professional colleagues to assure validity. Six major themes were identified: clinical instructors use experience as a learning resource, clinical instructors learn in order to solve a problem, clinical instructors use a variety of methods to learn

how to conduct clinical instruction, some clinical instructors have a natural ability for teaching but some do not, clinical instructors must learn to teach with less time, and clinical instructors vary in their self-directedness and internal motivation.

In Chapter 5, the answers to the research questions are integrated with the findings of Phase 1 and Phase 2 and the results are interpreted in light of the literature. Implications for the profession and indications for further research are also discussed.

Chapter 5

Discussion

Medical laboratory scientists provide critical information for the diagnosis and follow up of patients. To ensure that these professionals are well educated and competent, students of medical laboratory science first must successfully complete an accredited bachelor-degree program and then pass a certification examination. Part of the accredited program is a series of rotations through hospital laboratory departments where the students are taught by clinical instructors. Clinical instructors in MLS are critical to the success of the students as health care professionals. Since there is little or no training or orientation to teaching, clinical instructors somehow need to learn how to be clinical instructors.

The purpose of this study is to describe the lived experiences of medical laboratory science clinical instructors as adult learners in their role as instructors. The research question of this research is "How do medical laboratory science clinical instructors learn to conduct clinical instruction?" There are three subquestions related to the primary research question, "What does a clinical instructor do to learn clinical instruction?" and "What experiences do clinical instructors call upon to help them in learning to be clinical instructors?" and "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?"

Chapter one began by explaining the importance of medical laboratory scientists to health care and thus the importance of their being well educated. The critical role of clinical instructor and the lack of understanding of how clinical instructors learn to conduct clinical instruction were discussed.

In chapter two, the literature relating to clinical instruction and adult learning were presented. Topics reviewed included clinical instructors, adult learning, experiential and situated

learning, and tacit and informal learning. The literature review of each topic provided the understanding and framework from which the results of the research were interpreted.

In chapter three, the mixed methods approach was described and justified. The research commenced with Phase 1 in which a questionnaire was sent to clinical instructors of six university medical laboratory science programs in the Midwest. The results of the data collected through the questionnaire informed Phase 2, which consisted of qualitative, interpretive interviews. The results of the questionnaire data when compared with the results of the interviews also served as an internal validity check for the research. In Phase 2, six clinical instructors were interviewed in order to hear their personal, in-depth experiences of learning to conduct clinical instruction.

In chapter four, the results of both phases of the research were presented. Results from Phase 1 included demographic results, results that pertained to each of the research subquestions, and statistical analyses from questionnaire data. Themes from the Phase 2 qualitative interviews emerged as the verbatim transcripts were systematically and repeatedly analyzed. These results were presented as emergent themes and subthemes. The major themes were: using experience to learn clinical instruction, learning in order to solve problems, learning by a variety of methods, natural ability to teach, less time to teach, and self-directedness. The culmination of the research resulted in a thick, rich description of the phenomenon of how medical laboratory scientists learn to conduct clinical instruction.

This chapter, chapter five, will now provide a discussion of the results presented in chapter four in light of the literature review in chapter two. The results from Phase 1 and Phase 2 will be integrated and used to answer the research question and subquestions. Strengths and

limitations of the research will be discussed. Recommendations for the application of this research will be discussed and, finally, recommendations for further research will be made.

Significance

Our health care is in the hands of the professionals that clinical instructors have instructed in medical laboratory science programs. Although the role of the clinical instructor is essential in the professional education of MLS students, these instructors usually have no educational training. Knowing how these clinical instructors learn to conduct clinical instruction will help identify experiences that enhance their development. The university programs or professional organizations can then use this knowledge to help clinical instructors. Perhaps some learning experiences can be formalized to enhance learning of clinical instruction. Perhaps a way to accelerate the process of learning of instruction can be developed from this research.

This research will also add to the body of knowledge of adult education regarding informal learning and experiential knowledge in the context of medical laboratory science education. Understanding the learning of clinical instruction from the clinical instructor's point of view will also result in an appreciation by university program administrators and hospital administrators of what is involved as professionals learn to conduct clinical instruction.

Review of Methods

A mixed methods approach was used in this research. In Phase 1, a questionnaire was sent to some education coordinators of six university medical laboratory science programs in the Midwest. The coordinators then distributed the questionnaire to a total of 293 clinical instructors who return the questionnaires to the coordinators to return to the researcher. Fifty-one questionnaires were returned. The data from the questionnaires were entered into an Excel® spreadsheet. Descriptive statistics were calculated, and ANOVA and chi-square statistics were

run. The answers to open-ended questions were tallied and grouped. The results of the data collected through the questionnaire were studied in order to gain a better understanding of the phenomenon of learning clinical instruction. This understanding then informed Phase 2, the qualitative, interpretive interviews.

In Phase 2, six clinical instructors were interviewed in order to hear their personal, in-depth experiences of learning to conduct clinical instruction. Four interviews were individual interviews; two interviews were conducted with pairs of clinical instructors. The interviews were held at the clinical instructors' places of employment immediately after their shifts ended. The clinical instructors were very cooperative and thoughtful. The interviews were transcribed word for word immediately after each interview. The transcripts were read in their entirety upon completion and reread several times throughout the research. The experience learning to conduct clinical instruction was summarized for each participant. Horizons that could potentially be meaningful for answering the research subquestions were identified for each transcript and then grouped. The groups from all participants' transcripts were then combined and meaning statements were identified. From this, themes and subthemes were identified. These themes were double checked against the questionnaire results, especially the open-ended questions. A thick, rich description of the experience of a clinical instructor doing clinical instruction was then composed. This description was also checked with the participants who confirmed that the description did, indeed, describe their process of learning clinical instruction.

Discussion of research questions with reference to literature

The primary question of this research is "How do allied health clinical instructors learn to conduct clinical instruction?" Each of the three subquestions related to the primary research question will be discussed and related to the literature, mostly the literature of other health care

professions as MLS literature about clinical instructors as learners is sparse. Figure 10 shows the relationships of the research subquestions with the themes identified in chapter four. Theme 5, less time to teach, is an important consideration for all of the subquestions.

Figure 10 Relationships of Subquestions with Themes

Subquestion 1"What does a clinical instructor do to learn clinical instruction?"

Theme 3: CI use a variety of methods to learn how to do clinical instruction

a. It would be helpful to observe a good CI at the beginning.
b. CI learn to teach through trial and error, e.g. making mistakes.
c. CI learn to teach by teaching.
    i. CI learn to individualize instruction through experience.
    ii. CI learn that students learn better by doing the bench activities for themselves rather than just observing.

Theme 4: Some CI have a natural ability for teaching but some do not.

Subquestion 2 "What experiences do clinical instructors call upon to help them in learning to be clinical instructors?"

Theme 1: CI use experience as a learning resource.

a. CI inform their teaching with experiences they had as a student or trainee, good and bad experiences.
b. CI learn to teach through life experience and parenting.
c. CI learn to teach through job experience.

Figure 10 (continued)

Subquestion 3 "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?"

Theme 1: CI use experience as a learning resource.

Theme 2: CI learn in order to solve problems and they apply their learning for immediate use.

Theme 6: CI vary in their self-directedness and internal motivation.

Subquestion 1. Subquestion 1 asks, "What does a clinical instructor do to learn clinical instruction?" Theme 3 and Theme 4 answer that question - clinical instructors use a variety of methods to learn how to conduct clinical instruction, and some clinical instructors have a natural ability for teaching and some do not. In this research, in both Phase 1 and Phase 2, clinical instructors identified many different activities and resources that they used to learn how to conduct clinical instruction. The most consistently mentioned methods were observing a good clinical instructor, trial and error, and learning to teach by teaching. On the other hand, clinical instructors do not prepare for this role before taking on clinical instruction.

Observation. Many participants (88%) mentioned that they had used or would like to use observation of experienced clinical instructors early in their learning. By watching another clinical instructor, especially a good clinical instructor who is teaching the bench that the observer will be teaching, the observer will pick up subtle ways to interact with students related to the specific skills and content that they will be teaching.

Observing others teach does not mean that the new clinical instructors would just mimic what they see. Participant F, Flo, explained that she would not necessarily teach the same way as

the person she would observe. Scanlon (2001) also found that her participants, after watching others teach, "would make judgments about the appropriateness of a particular approach to students and think about whether they would use such an approach" (Experiences As Nurse section, para. 2).

Knowles (1980) and Caffarella (2002) explain that adult learners like to watch other people. "Watching others" for Knowles and Caffarella, however, includes the use of mentors, which few participants in the current research reported having. The participants who did have mentors (only 12%) found their mentors through informal, circumstantial means. There is little formal mentoring of clinical instructors in MLS.

Observing other clinical instructors becomes less important as a clinical instructor continues to develop as an instructor. Statistical analysis confirms that the more years as a clinical instructor, the less a clinical instructor watches other instructors.

Trial and error. Many clinical instructors (82%) said that they learned to teach through trial and error; for example, they learned by making mistakes and trying out different techniques and finding ones that work in different situations or with different students. As Participant C, Chad, said, "Teaching over the years, I have evolved and I learned just from trial and error and how the students respond." Scanlon (2001) found that novice nursing clinical teachers used trial and error to solve problems because, like most MLS clinical instructors, they had no orientation. The teachers had to "hypothesize about what might work using familiar experiences as a frame of reference" (Processes Through Which Clinical Teaching is Learned section, para. 2).

Learn by teaching. Many clinical instructors also said that they learned to teach by teaching. As Participant C, Chad, said, "I just think that with each student I probably get better at it. Just like the more you do it, you improve." Two specific things that were learned through

teaching experience were identified: how to individualize instruction and that the students learn better by doing the bench activities themselves rather than just observing the instructor doing the activities.

In research about different stages of a clinical instructor's life, Daley (2003) found that expert teachers learn to interact with the student and adjust their teaching to the student and circumstance. Interviewee B, Bonnie, explained that at first she just went through the procedure with the student without varying her approach, but later she learned to "read the student" and adjust her teaching.

In both Phase 1 and Phase 2, several clinical instructors mentioned that they had learned that students learn better by doing the bench activities rather than just observing. Participant C, Chad, particularly emphasized this,

> I'll say 'Press the start button" but I won't press the start button, I'll make them. Every little thing that we have to do, I make them do it. So, because then I think they really have to focus and concentrate on what they're doing, but if they're just watching you do everything, their mind could wander or they start thinking about something else because they're not having to focus as much.

If possible, having the student perform the skill from the beginning will intensify the student's attention and motivation. Assuming immediate supervision and guidance from the instructor, the student will be doing the skill correctly from the very beginning and will remember it better by doing it. In many cases, however, it is appropriate to have the student observe the activity first so he/she will not be injured and will not ruin the patient sample or damage the instrument.

Learning is "modification of a behavioral tendency by experience"(Merriam-Webster, 2011, np). A change in behavior, such as a change in teaching technique, is an indication of

growth and learning. On the questionnaire, most participants indicated that they had changed teaching techniques at least a little. Only 16% said that they had not changed techniques at all. When first questioned, some interviewees denied that their teaching techniques had changed. Eve did not think that her teaching technique had changed since she began teaching. Responses to further questions about how and why their teaching techniques did change, showed that they had changed teaching methods, attitude, content, and resources. Eve went on to say that she had learned to adjust, "If [students] are not getting it, you need to rethink how you're doing it." She had learned to use different techniques so she could use them in different circumstances.

Many of the participants in both phases of the research had been teaching for many years and mentioned that they had to change their teaching as a result of new content and skills on the bench. Medical technology and knowledge is expanding at a faster and faster pace and clinical instructors need to incorporate the new knowledge and skills into their teaching. They also changed their teaching as a result of gaining experience teaching, finding what helps the students learn better. A few participants mentioned changing their teaching as a result of advice from the university or managers. It seems, however, that most clinical instructors are functioning pretty much autonomously. Few (10%) get feedback from supervisors or managers. Only 56% of the participants reported being evaluated at all as clinical instructors. In addition, even though most universities have students complete evaluations of their bench rotations, interviewees reported that the clinical instructors may not receive the results of these evaluations.

Knowles (1980) explains that adults will evaluate their own needs for learning, saying, "Adults get evidence for themselves about the progress they are making toward their [learning] goals" (p. 49). Clinical instructors use formal evaluation feedback if it is available, but they also use other mechanisms. Most clinical instructors in the current research used direct student

feedback such as asking the students what they need, paying attention to the types of questions the students are asking, and using other verbal and nonverbal feedback. For example, Amy explained, "I will usually talk to [students] and say 'Is there anything else you need?' … and then if they need something, I'll give it or talk to them." If students do not understand or other problems arise, the clinical instructors are more likely to try new things or seek advice.

Lack of preparation. Unlike physical therapy which has voluntary clinical instructor certification (Wilson, 2002; Wojceichowski, 2007), medical laboratory science does not prepare its clinical instructors. Most of the participants in this research (84%) did not learn how to do clinical instruction before they had their first student. Perhaps preparation does not occur because teaching is not a priority; it is unrewarded and clinical instructors do not get respect from their peers. On the questionnaire, less than 2% of the participants reported extra pay or esteem of peers as rewards for being a clinical instructor.

In a survey of all MLS (not just clinical instructors), Guiles and Ward-Cook (2006) found that 47% of MLS practitioners learned teaching skills on the job. Twenty-five percent of MLS practitioners first learned teaching skills as a student. They also found that 27% never learned teaching skills. Presumably those who never learned teaching skills are not clinical instructors. If it had been a study of all clinical instructors, the percent who learned teaching skills on the job would greatly increase. Nonetheless, like the current research, the largest group did not prepare for the role of clinical instructor.

Teaching comes naturally. Some clinical instructors are able to instruct without "doing" much to learn how to do it, that is, it comes naturally to them. Participants reported that much of what they do as clinical instructors comes naturally, without thinking. Only 8% reported that "none" or "almost none" of what they do comes naturally. When asked to discuss this further, the

interviewees all agreed that some people are natural teachers. They agreed for the most part that not every MLS should be a clinical instructor because not everyone is cut out to be a teacher. As Amy said, "People who are not made to teach will never be a [good] teacher...they do not like it, they do not want to do it." Bonnie said, "Some people don't have the patience to teach. Some people are fabulous techs and they know what they are doing but they are not good teachers." Chad said, "Some techs are just not good at teaching or explaining, they cannot clarify what they are trying to teach." He went on to say that being able to teach well is more important than knowing the content well. Flo said, "I don't think all of them are patient enough or willing to work with the students."

On the other hand, the teacher education literature says that teachers are made, not born. The *International Handbook of Research on Teachers and Teaching* (Saha & Dworkin, 2009) says, "People are made into teachers; they are not born to be teachers" (p. 6). They go on to say, "Teachers are always in a *state of becoming"* (p. 7). The interviewees explained that although people can learn to do clinical instruction, if they are not gifted teachers and do not want to teach, they will not be good teachers. As with any teachers, all MLS can probably learn to be clinical instructors. However if they do not have any natural ability or interest, they may not do a good job. Like all teachers, clinical instructors will continue to learn as they continue to teach.

Subquestion 2. This subquestion asks, "What experiences do clinical instructors call upon to help them in learning to be clinical instructors?" As seen in chapter four, Theme 1 confirms that clinical instructors do use experience as a learning resource. Although they used many different types of experience, the participants predominantly used three types of experiences: experiences they had as a student, life experiences, and job experience. We have

also seen that clinical instructors also use their experiences teaching to learn clinical instruction; they learn by doing.

The participants in this study confirmed what the literature says, that experiences as students are used to shape the way instructors teach. In her article about clinical teachers of nurses, Scanlon (2001) says, “Clinical teachers use their own experiences and the way they were taught to shape their teaching practices” (para. 1). Daley (1999) says that novices, in particular, teach in the manner that they themselves were taught. Participants Bonnie and Flo mentioned bad experiences as students, feeling unwanted and in the way of their clinical instructors. They each teach with this experience in mind, not wanting their own students to feel this way. The effect of strong emotion on learning from experience is described by Dirkx and Lavin (1991). In their discussion of their FOURthought model of experiential learning, they explain that learning from experience often results from emotional, affective, aspects of experience.

In addition, statistical analyses in the current research show that experiences as a student are less likely to affect older clinical instructors, those with more years in the profession, and those with more years as clinical instructors, and those who have raised children. Of course, all of these are related to age. On the other hand, clinical instructors who have given some lectures in their program are more likely to refer back to their student experiences. Guiles and Ward-Cook (2006) found that 25% of all practitioners (not just clinical instructors) first learned teaching skills as a student. For the practitioners who learned teaching skills as a student it was unclear whether they learned these skills by watching their clinical instructors, as suggested by the current study, or as part of the curriculum. The accrediting agency for MLS programs, the National Accrediting Agency for Clinical Laboratory Science, requires that every program address the Standard 22 B7: “The curriculum must include education techniques and terminology

sufficient to train/educate users and providers of laboratory services." (2011, n.p.) This standard, however, does not require education techniques and terminology to train students. Some participants in Guiles and Ward-Cook's study may have been referring to the educational component when they said that they learned how to teach as students. However, many current clinical instructors went through programs before this was required. Only Participant D, Dawn, mentioned having a course in education during her bachelor's degree program, but she said that there were very few transferable skills to clinical instruction. However, she did feel that the course may have helped her communication skills and ability to organize her instruction.

Lawler commented that adults have more experiences to use as resources as they age, "As we grow older we have more and more experiences that influence our lives and our thinking" (p. 16). However, the literature in nursing and allied health professions has little to say about how clinical instructors learn to teach from life experiences such as parenting. It is clear in the current research, nevertheless, that life experiences play a role in learning how to conduct clinical instruction. When asked if life experience helped her learn to do clinical instruction, Flo emphatically responded, "Definitely." As Eve said, "I was a scout leader and, you know, I taught. I was a scout leader and a den mother. You get experience teaching there." On the questionnaire, participants were asked about experiences teaching in other settings, such as Sunday school. Many people did teach in other settings and most of them, but not all, reported that such experiences affected their clinical instruction. Participants were also asked how much raising children affected their teaching. Interestingly, the responses were contrasting, with many saying that it did affect their teaching, but an almost equal number saying that it did not affect their teaching (see Figure 9 in chapter four). The participants who were interviewed all said that

parenting did affect their teaching. They mentioned patience as an important quality gained from parenting, a characteristic that is also helpful in clinical instruction.

The interviewees also explained that job experience was also crucial in learning how to conduct clinical instruction. For example, by knowing their jobs intimately, they learned how to sequence their instruction for the students. By working on the bench they also learned what to teach, although Bonnie and Chad commented that they needed to remember that students do not need to know everything that they have learned about the job over the years.

Subquestion 3. This subquestion asks, "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?" One of the key principles of adult learning is that adults have experience to draw upon, to use as a resource, as they learn. As Knowles (1980) said, "Adults have a [rich] foundation of experience to which to relate new experiences (and new learnings tend to take on meaning as we are able to relate them to our past experience)" (p. 50). This research found that clinical instructors definitely use experience as a learning resource, as the preceding discussion on Theme 1 in the Subquestion 2 section indicates.

In chapter four, Theme 2 states that clinical instructors learn in order to solve problems and they apply their learning for immediate use. These are two of the six assumptions about adult learners identified by Knowles (Knowles, 1995; Cooper & Henschke, 2002). Many clinical instructors act as adult learners in that they learn in order to solve problems and they apply their learning for immediate use. The interviewees indicated that they may reflect on their teaching and ask for advice when they had a problem such as a student who just does not "get it." The interviewees reported that they reviewed and used feedback from student evaluations. However, they want to see the evaluations in a timelier manner (more immediate feedback). Several

mentioned that they seldom, if ever, see the evaluations. The universities collect the evaluations and may not get them back to the clinical sites.

Self-directedness is another key assumption of adult learning. Theme 6 of this research is that clinical instructors vary in their self-directedness and internal motivation. Some are very self-directed and motivated and some are not. Brookfield (1992) explained that "Some adults are self-directed, or critical, and others aren't" (p.14). He went on to say that their self-directedness depends on the context. Perhaps the contexts of clinical instruction, including the stress and lack of time, provide a disincentive for self-directedness in clinical instructors. Given more time, clinical instructors might be more self-directed and intentional about learning how to be better clinical instructors.

The interviewees also mentioned that having students while trying to do patient work could distract a clinical instructor so that he/she might make a mistake or would not catch a mistake that the student makes that could affect a patient's health care. As Chad explained,

> I have in the past been distracted, someone's talking to me or whatever, and then [the student is] verifying something they shouldn't be but it's on my tech code and I'm called into the office the next day and so you know that's certainly not an incentive if anything, it's kind of a burden. I've had that happen a few times.

This concern about making an error on patient samples could motivate them to concentrate less on their teaching role. Lawler (2003) commented that some situations can lead a lead a teacher to resist learning, "Teachers of adults may also face challenges…that seem to turn them off instead of motivating them for growth, learning, and change" (p. 15).

Concepts not supported by this research. Two concepts that I originally thought might play a larger role in clinical instructors learning to conduct clinical instruction were situated

learning and tacit learning. Situated learning, where learning is shaped by and framed by the social and cultural context, does not seem to be a large part of the learning process of MLS clinical instructors. Hansman (2001) explained that, "The core idea in situated cognition is that learning is inherently social in nature" (p. 45). This means that people learn as they participate intimately with a community or culture of learning, learning and accepting the community's assumptions and roles. Clinical instructors function within a community of medical laboratory scientists, but they do not seem to have a community of clinical instructors. Clinical instructors do not feel rewarded within the community of practice and there is no esteem associated with the role (see chapter four discussion of questionnaire question 12). In addition, the community does not provide preparation for medical laboratory scientists to be clinical instructors. Neither the formal work community (place of employment) nor the informal communities (the laboratorians or other instructors or even the professional organization) provide much preparation, socialization, or support for clinical instructors. Interviewees mentioned that the laboratorians on the job rarely talk about teaching. Clinical instruction appears to be tacked onto the profession as opposed to being an integral part of it. Almost all of the learning by clinical instructors involves informal learning as opposed to formal learning. Most clinical instructors do not go to classes on how to teach. Even if they do, most of what they learn is learned informally through trial and error and other experiences.

I expected that the participants would have difficulty explaining how they learned how to conduct clinical instruction because I expected that a lot of what they learned was implicit, tacit knowledge. Scanlon (2001) found that ways of learning for nursing clinical teachers were frequently implicit and intangible. However, without exception, the participants in the current research attributed most of their knowledge about clinical instruction to experiential learning.

They were able to verbalize what they learned and how they learned it (mostly by experience). In remembering their experiences learning to do clinical instruction, the instructors seemed to be "seeing" their own instruction and remembering specific techniques that their instructors used. In tacit learning, they would be remembering vague general recollections that they could not describe.

Experiential learning could consist of tacit knowledge, although this was not evident in this research. Through better probing questions, the researcher perhaps could have drawn this out of the participants. As Eraut (1994) points out, "People do not know what they know" (p. 15). How they know is even more problematic.

Jarvis (1992) posited that tacit knowledge is developed within practitioners as a result of consciously monitoring the situation (in this case the teaching-learning interactions at the bench) and reflecting on their actions and adjustments to the situation. Jarvis explains that the process of acquiring tacit knowledge is based on two assumptions: that practitioners monitor their practice and that they adapt their practice to different situations. MLS clinical instructors, however, do not spend a lot of time thinking about clinical instruction. Some participants in the current research do not reflect at all on teaching (12% said never and an addition 16% said almost never). Clinical instructors who are less interested in teaching or have less time, such as those who did not participate in this research, probably reflect about their clinical instruction even less than the participants in this study. The participants in the current research, however, definitely did report adapting their teaching to different situations, and thus may acquire tacit knowledge through this adaptation process.

Participants who do reflect said that they reflect when they encounter a problem situation. Scanlon (2001) found that situational reflection is a characteristic of novice clinical teachers.

Scanlon found that novice clinical teachers did not like to reflect on their teaching, whereas expert clinical teachers recognized how reflection facilitated their learning as teachers. Novices were preoccupied with managing specific teaching situations so they did not have perspective about the meaning of their actions. Mezirow (1991) says that, "Reflection is the central dynamic involved in problem solving, problem posing, and transformation of meaning schemes and meaning perspectives" (p. 116). Since the current research indicates that some MLS clinical instructors do not reflect a lot on their teaching and that they focus on specific problem situations, perhaps these MLS clinical instructors function at the "novice" level of clinical teaching.

Those MLS clinical instructors who do not reflect on their clinical instruction may delay their progress in learning to be better clinical instructors; however, there are several explanations for their lack of reflection. First, teaching is not their job or profession. In this research, 59% of the participants said that they had no say in whether they became a clinical instructor, they were assigned to be an instructor. Second, MLS clinical instructors do not have the time or energy to reflect on their teaching. This research points out that clinical instructors have time constraints that they feel affects their ability to teach as well as they would like. Most clinical instructors are expected to teach students (and learn how to teach) while the instructors are responsible for the same amount of laboratory work as if they did not have students. Flo proposed that she could perform both her bench work and teaching if she had a clone of herself.

Interpretation of questionnaire data and the interview data in this research must include consideration of this time challenge. The lack of time is a serious issue that threatens the quality of laboratory results, the quality of instruction, and the willingness of laboratorians to teach. A

laboratorian told me recently, “I know I am being selfish in not teaching, letting others do it when we need new techs so desperately, but we just don’t have the time [to teach].”

In addition, the nature of the bench work itself does not provide a very reflective atmosphere. Medical laboratory science work is highly technical and the workload is heavy. Most results on patient specimens are expected to be reported within a couple of hours. Medical laboratory scientists must make quick decisions and move on. At the end of their shift, someone else takes over. They go home and seldom think about it until the next day. Twelve percent of the clinical instructors in the current research never think about their teaching. On the other hand, some clinical instructors do think about teaching even when they are not teaching. Bonnie made a point of saying that she thinks about teaching when she goes home.

Eraut (1994) explains that school teachers also must make quick decisions under stressful conditions. Teachers do not have the luxury of time to deliberate before making a decision and so decisions must be largely intuitive, based on tacit knowledge. So practical knowledge and experiential learning can involve tacit knowledge. Marsick and Watkins (2001) say that “It is clear to us that [incidental learning] is always occurring, with or without our conscious awareness” (p. 29). Clinical instructors in the laboratory may indeed be using tacit knowledge as they learn to conduct clinical instruction, but this was not evident in this research.

Strengths and limitations

Strengths. Interest in clinical instructors in allied health professions has increased as evidenced by the number of dissertations on the topic in the past ten years. In MLS, at least one other dissertation about clinical instructors is being defended in 2011 (W. Miller, personal communication) and clinical instructors will be the topic of a session in 2012 at the Clinical

Laboratory Educators' Conference (Y. Simonian, personal communication). So the relevance and currency of the topic of this research is one of its strengths.

The design of the research is also a strength of the research. Because the Phase 2 participants had participated in the Phase 1 questionnaire, they were familiar with the research question. They had time to think about the subject and this undoubtedly led to more thoughtful responses. Also, interviews were conducted until the saturation point, until no new data was being seen, until nothing new was being said.

Triangulation, collecting and analyzing data in multiple ways, helps assure that the research will have internal validity. Phase 1 and Phase 2 data were analyzed, compared, and merged to bring about an accurate, rich description of the phenomenon of learning to conduct clinical instruction. Interviewees performed member checks, checking the summaries of their individual experiences and also critiquing the thick, rich description. A colleague checked the accuracy of the horizonalization of two interviewees' transcripts and also critiqued the preliminary emerging themes. She commented that the analysis was, "Very thorough."

Another strength is the researcher's familiarity with other health care professions. This helped in applying the literature of other professions to this research in medical laboratory science.

I was also happy with the completion of the questionnaires in Phase 1. The questionnaire was lengthy and I expected that many clinical instructors would just complete the questions with Likert-like scales. I was pleasantly surprised to find that all of those people who took the time to take the questionnaire completed almost every open-ended question. As a result, I collected some rich data.

Limitations. One potential limitation of Phase 1 is the small sample size (51). It was cumbersome having to go through the program directors or education coordinators who then gave me the names of contacts at their affiliated hospital laboratories; however, there was no other way to do it. I am grateful to the hospital contacts who then distributed, collected, and returned the questionnaires for me. I sent multiple reminders by email and/or telephone and still ended up with questionnaires being returned months later and many not being returned at all. In addition, I was unable to see if there were differences between university programs. There were not enough participants from each program and a few participants taught students from more than one program.

There were a limited number of male participants. Data for gender were not able to be analyzed because of so few males, about ten percent of the participants. However, the number in this research reflects the gender distribution of the profession of medical laboratory science which has predominantly female professionals. In Phase 2, I selected five females and one male, roughly keeping the same percentage. However that only gives the perspective of one male. This is a potential limitation, although I did not notice any differences in his answers that would be gender related.

Since the participants in Phase 2 did complete the questionnaire in Phase 1, it is possible that they might have been influenced by the questions. However, the participants seemed very open about disagreeing with some questions. For example, Amy thoroughly disagreed with my contention that clinical instructors who are supervisors may have learned to do evaluation by being a supervisor. She thought that evaluation as a supervisor and evaluation as an instructor are not related.

I intended to conduct a couple of focus groups in this research. In the past, I have had good success, collecting rich data in focus groups. One participant will mention something that leads another participant to an idea or memory that they had not thought of and then the discussion snowballs. I did not conduct true focus groups of five to ten participants, but I did conduct two interviews of two participants each. Potential limitations are that one participant may dominate the conversation or that one participant may lead or influence the other participant. I did not find this to be the case, however. With Bonnie and Chad, I hardly had to ask the questions. One would almost finish the other person's sentences. With Dana and Eve, the dynamic was completely different, but in a good way. Eve was reluctant to speak at first and she opened up as we went along. I think she felt more secure having a coworker participating. I do not think she would have contributed as much if I had interviewed her separately. As we proceeded she did not always echo or agree with Dana and she contributed good data for the research.

Other potential limitations are the interviewing skill and biases of the researcher. Although I have done two qualitative research projects now, I am still learning how to ask follow up probes that will elicit deep thoughtful answers. Questions about experiential and tacit learning are especially problematic as participants find it difficult to put these types of learning into words. In order to recognize and minimize my bias in this research, I completed both the questionnaire and the interview questions. By recognizing my own experiences and opinions, I could make sure that the data from the participants spoke for itself.

As with all qualitative studies, the conclusions cannot be generalized to a larger population. However, readers can apply the conclusions of this research to their own situations by reflecting on the data and analysis in their own contexts. The research was also limited in that

the participants in this research were only from the Midwest region of the United States and were only from hospital affiliates of university programs (not hospital-based programs). The Phase 1 sampling was not random and the Phase 2 sampling was a convenience sample of volunteer, highly interested, motivated participants. The thick, rich description of how clinical instructors in medical laboratory science learn to conduct clinical instruction is not meant to describe all clinical instructors; it only describes the participants in this research.

Lastly, medical laboratory scientists who are clinical instructors are now teaching, an activity that involves insight into human behavior, something they are not used to and do not have experience doing. This is a big change from what they normally do in the laboratory, which could explain why some medical laboratory scientists are not "natural" at instruction. Many medical laboratory scientists went into laboratory work because they preferred bench work to working with patients. This should be considered when applying this research to other professions.

Implications for the field

All of the participants felt unprepared to do clinical instruction, to teach MLS students at the bench. I suggest, as some of the participants suggested, that clinical instructors be provided an orientation to clinical instruction that includes observation of an experienced "good" clinical instructor. A guide of what to look for during the observation could also be helpful.

Quite a few participants wished that they had taken a course on teaching. However, I am not endorsing training courses on how to teach. Although they might be somewhat helpful, this research found that much of the learning of clinical instructors occurs through experience. This is appropriate for adult learners as they will learn better from immediately applicable learning and from experiences such as problem situations rather than from formal courses, especially lecture-

style courses. An alternate (or supplement) to a course in teaching is a clinical instructor blog or similar activity. Using a blog, the clinical instructors could compare successes and challenges with each other, and it would provide a forum for reflection and support. This assumes that they can find the time to participate in a blog or similar activity.

I highly recommend that clinical instructors get formal feedback as well as informal feedback from the students. Perhaps clinical sites can use their own feedback forms if the university does not return them or does not return them in a timely manner. Although clinical instructors do seek direct feedback from the students, this feedback is usually verbal or nonverbal feedback about a specific concept or task. Such direct feedback might be recognition of a puzzled look or something like, "What did I say was the most important step?" A formal evaluation gives the students a chance to give feedback on larger issues such as the quality of explanation and the sufficiency of practice at the bench. A formal evaluation is also anonymous, so the students may be more willing to give critical feedback on a formal evaluation as opposed to a direct, face-to-face informal evaluation.

Almost all participants agreed that not everyone working in the laboratory should teach MLS students. So I think it is best to have a process by which clinical instructors are selected. This should be accompanied by recognition and esteem for clinical instructors. This will take a change in the culture of many laboratories, which will be difficult to accomplish. In Dana and Eve's hospital, for example, all laboratorians are expected to teach regardless of how well each one teaches. To make only a few people teach would be unfair because it would be punishing the good people with extra work. This leads to my next point, teaching should not be "extra" work.

The lack of time for teaching needs to be addressed. Almost all clinical instructors reported that they did not have enough time to perform their bench responsibilities and teach

students and do both well. In an ideal world, administration would provide more staffing, but this is unlikely to happen. Perhaps some sort of support system for clinical instructors can be provided, a blog, online resources from the universities, or back rubs, for example. Both university program officials and hospital administrators understand the need for the instruction of students at the bench and how critical this is for a student's education. I encourage both parties to come up with creative ways of providing this experience for the students.

Summary

The findings of this research illuminate the ways in which clinical instructors of medical laboratory science students learn to conduct clinical instruction. The research question, "How do medical laboratory science clinical instructors learn to conduct clinical instruction?" has been answered through a mixed methods approach. Results were obtained by analysis of the Phase 1questionnaire responses from 51 clinical instructors and interviews of six clinical instructors. The research resulted in a thick, rich description of the experience of a MLS clinical instructor learning to conduct clinical instruction

MLS clinical instructors learn to conduct clinical instruction by a variety of means, primarily through experience, as adult learners. They learn through their experiences as students, experiences as instructors, life experiences, and job experiences. As adult learners, they learn in order to solve problems and they apply their learning for immediate use. Clinical instructors vary in their natural ability to teach. They also vary in their self-directedness.

Clinical instructors of medical laboratory science students have a critical role to play in the education and development of their students. They have little or no formal preparation for their teaching roles, little support for teaching, and not enough time to both perform their work with patient samples and clinical instruction. In these times of health care belt-tightening, these

clinical instructors must learn to conduct clinical instruction with less time and more stress. By understanding how clinical instructors learn, hospital management and university MLS programs will be better prepared to support new clinical instructors in their initial learning and experienced clinical instructors in their lifelong learning. The quality of instruction of our medical laboratory science students depends on how well clinical instructors learn how to be clinical instructors.

Suggestions for further research

Although the purposes of research are to answer questions and add knowledge to the field, usually more questions arise. The current research is no exception.

Future research could investigate the types of orientation and training that would improve clinical instruction, make clinical instructors feel better prepared, and/or provide a head start to their learning of clinical instruction. A checklist could be developed for orientation or training, for example, a list of what to look for when observing an expert instructor, or what to look for in a student's behavior when evaluating them.

Medical laboratory science would benefit from research about what other health care professions do to prepare their clinical instructors. It would also be instructive to learn how other health professions cope with the time stress of doing the job and teaching. Knowledge about how other professions reward their clinical instructors and recognize them would also be beneficial.

On a more theoretical note, further research into the relationships between experiential learning, transformational learning, and tacit knowledge are needed in areas other than business. For example, further research could explore how experiential learning becomes automatic, implicit.

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Appendix A

CLINICAL INSTRUCTOR QUESTIONNAIRE COVER LETTER

Thank you for agreeing to complete this questionnaire. It should take about 20-30 minutes. This research is part of a PhD dissertation in adult education at the University of Missouri-St. Louis (UMSL). The purpose of the research is to describe the experiences of medical laboratory science (clinical laboratory science/medical technology) clinical instructors related to learning how to be a clinical instructor (learning how to teach in the clinical setting). This survey is about YOUR learning, not the student's learning.

For the purposes of this research, "clinical instructor" means a bench instructor, an instructor employed by the healthcare facility who teaches clinical skills to undergraduate CLS/MT students at the healthcare facility after the students have had introductory courses and labs at the university.

By completing this questionnaire, you are agreeing to participate in this research. This research has been approved by the Institutional Review Board (IRB) of UMSL. You are encouraged to answer every question, but you may leave questions unanswered and you may stop or withdraw from the study at any time without retribution. You may write on the back if you need more room. The questionnaires will be seen only by the researcher and statistician and will be kept in a locked filing cabinet and will be destroyed after five years.

There is no reward for participating in this research. Risk of participation is no greater than that of daily life. Discomfort is unlikely but possibly embarrassment or reliving of bad memories could occur. Benefits include deeper reflection about your teaching and contribution to research about clinical education.

On the last page is a place for you to provide your name and contact information ONLY if you would like to participate in an interview to follow up on this topic. The interview will be held at your convenience in the next few months. Otherwise, you do NOT need to include your name.

Return: Please give your completed survey to the person at your facility who is coordinating this for me. They can return the survey by scan/email, Fax, or mail (let me know if you need a postage paid envelope). You can also request an electronic copy or return your survey directly to me if you like. Thanks!

If you have any questions or concerns about this research or if you would like a copy of the results of the questionnaire, contact me, the Principle Investigator, Linda McCown, at mxxxx@comcast.net or 314-288-xxxx (cell).

UMSL Human Subjects Committee Protocol No. 090811M

You may tear off this page and keep it for future reference.

CLINICAL INSTRUCTOR QUESTIONNAIRE

1. What is your age (years)?_____ 2. What is your gender? ____Female ____Male

3. How long have been in the laboratory profession (years)? _____

4. Are you a supervisor or manager? ____Yes ___ No

5. What type(s) of certification, if any, do you have (MLS/MT, MLT, HEW, etc)?

6. Do you have certification in a specialty area? ___ Yes ___ No
If yes, what type of specialty?

7. What university(s) do your students come from? _____

In what department is your primary responsibility for teaching?
___ blood bank ___ chemistry
___ microbiology ___ hematology, coagulation, flow cytometry
___ other, please specify:

8. How long have you been instructing students in the clinical setting (years)? _____

9. How many students do you usually teach at the same time? ___ 1 ___ up to 2 ___ over 2

10. About how many students have you taught in the last year?___ in the last 3 years?___

11. How did you become a clinical instructor?
___ went through an application process
___ asked or volunteered
___ was assigned
___ other, please specify:

12. What rewards do you get for being a clinical instructor?
___ extra pay
___ esteem of my peers
___ get to put it on my resume
___ self-satisfaction
___ no rewards
___ other, please list:

13. How do you know how to be a clinical instructor in the clinical setting?

Mark an X in the space that represents your answer

Statement	Yes	No
14. Have you ever taught any of the didactic/lecture part of this university's program or any other program?		
15. Are you a clinical instructor in the same university program in which you were a student?		
16. Are you relieved of some work responsibilities when you have a student? How?		
17. Do you think that everyone with your credentials can be a clinical instructor? What credentials/experience should be required, if any?		
18. Do you think that everyone with your credential should be a clinical instructor? Why or why not?		

19. How much do you think about or reflect on being a clinical instructor (how you teach in the clinical setting)?
Never 1 2 3 4 5 Even when I am not teaching

20. How much has your teaching technique changed since you became a clinical instructor?
None 1 2 3 4 5 A lot

If so, why did your teaching techniques change?

How did your teaching techniques change?

21. How do you determine if you need to improve or change your instructional technique(s)?

22. If you had/have a mentor, was/is it __ a formal relationship, __ an informal relationship
__ no mentor

If you have had a mentor, how did you get a mentor?

23. What methods did you use to learn how to do clinical instruction (teach students in the clinical setting)? Mark all of the methods that you have used in the first column.
Mark all of the methods that were required of you by an employer or university program in the second column.
In the third column, mark methods that you continue to use .
In the last column, mark the two methods that you found to be the most helpful.

I have used	This was required	Continue To use	Most Helpful	
				Watching coworkers
				Being mentored
				Recalling methods used when you were a student
				Going through an instructor's orientation/training
				Going to a formal class/symposium on teaching
				Reading about how to teach
				Trial and error
				Asking students what works the best
				Other method, please list:
				Other method, please list:

24. When did you first use the methods listed in the table above?
___ Before I knew that I was going to be a clinical instructor
___ When I found out that I was going to have a student
___ While I had my first student(s) to instruct
___ During the first year
___ When I first had a problem with a student
___ After I received negative feedback about my clinical instruction
___ All clinical instructors at my facility/program had to do it
___ Other, please explain:

25. List methods in the table above or other methods you would like to use but have not had the opportunity to use, if any:

26. If you went through an instructors' orientation or training so, how long was it? _____

27. How do you decide when you need some help or advice on teaching or being a clinical instructor?

28. If you have read about how to teach better or be a better clinical instructor, which of the following did you read?
___ online materials
___ materials from a library (book, journal, online or hard copy)
___ materials provided by my employer
___ materials provided by the university program
___ materials I bought myself
___ other materials, please list:

Statement	**1** None	**2**	**3**	**4**	**5** A lot
29. How much do your own experiences as a student affect your instruction?					
30. How much do your own experiences as an instructor affect your instruction?					
31. How much difficulty have you had in learning to be a clinical instructor?					
32. How much of what you do as an instructor comes "naturally," without thinking? List some examples of what comes naturally for you, if anything (such as planning for instruction, questioning students, encouraging students, demonstrating, correcting student technique, creating teaching scenarios, modeling professionalism, being patient, correlating theory with practice, evaluating students, etc.)					

33. Are you evaluated as a clinical instructor? ___ Yes ___ No
If so, who does the evaluation of you?

34. What difficulties have you had in learning to be a clinical instructor or learning to be a better instructor?

35. Is there anything that you need in order to do a better job of clinical instruction? __ Yes __ No
If so, what?

36. Do you participate in the development/revision of the clinical rotation? ___ Yes ___ No
If not, would you want to be involved with this? ___ Yes ___ No
Why or why not?

37. Have you had experience teaching in another setting, such as a classroom, Sunday school, or Scout meeting? ___ Yes ___ No

Has this affected your teaching as a clinical instructor?
None 1 2 3 4 5 A lot

If so, how has it affected your teaching?

38. Have you helped to raise any children? ___ Yes ___ No

If you have helped to raise children, has this affected your teaching as a clinical instructor?
None 1 2 3 4 5 A lot

If so, how has it affected your teaching?

CLINICAL INSTRUCTOR
FOLLOW UP INTERVIEW (OPTIONAL)

Are you willing to be interviewed as part of the follow-up for this study?
If so, please include your name and email address and/or phone number. The interview will take place at a time and location that we agree upon, probably at your place of work. The interview will be audio taped; however, no names of individual people or institutions will be used in the study.

Name:

Email address:

Phone number:

Best time to call:

Thank you so much!

Results of this research will be included in a doctoral dissertation at the University of Missouri-St. Louis.
If you would like a copy of the results of this research, please indicate this here: _____
The results will be available in about 12-18 months and will be emailed to you.

If you have any questions or concerns about this research, contact the Principle Investigator, Linda McCown, at mxxxx@comcast.net or 314-288-xxxx (cell) OR contact the faculty sponsor, Dr. John Henschke at hxxxx@missouri.edu or 314-516-xxxx
.

Appendix B

Division of Education Leadership & Policy Studies

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Informed Consent for Participation in Research Activities

"Lived Experiences of Clinical Instructors of Clinical Laboratory Science as Adult Learners"

Participant _____ HSC Approval Number _090811M___

Principal Investigator _Linda McCown_____ PI's Phone Number _217-206-xxxx_____

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1. You are invited to participate in a research study conducted by Linda J. McCown (Dr. John A. Henschke, faculty advisor). The purpose of this research is to describe the lived experiences of clinical instructors in clinical laboratory science. This research asks, "How do clinical instructors learn to do clinical instruction? How do they know how to teach in the clinical setting?"

2. a) Your participation will involve completing a **survey**. At the end of the survey, you will be asked if you are willing to continue in the research and be interviewed individually or as part of a focus group. If selected, you will participate in an **interview** where notes and audiorecordings will be taken. After the researcher has transcribed and analyzed the interview, the participant will be asked to verify that the interpretation is correct. The participant can clarify anything, if necessary.

   Approximately 600 people will be involved with this research survey at hospital affiliates of six university-based clinical laboratory science programs. Eight people will be involved with the interviews.

   b) The amount of time involved in your participation will be approximately 20-30 minutes for the questionnaire. If you participate in the interview, about 45-60 minutes will be involved. At a later date you will be asked to review the written transcript of your interview.

3. There are certain risks and discomforts that may be associated with this research, such as such as embarrassment from being audiotaped, lack of recall, or the inability to express yourself. It is possible that questions during the research may trigger bad memories. There is little probability of harm or discomfort which is greater than that ordinarily encountered in daily life.

4. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about allied health education by providing insight into how clinical instructors learn to teach.

5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Linda McCown at 314-288-xxxx (xxxx@comcast.net), or the Faculty Advisor, Dr. John Henschke at 314-516-xxxx.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

_____ _____
Participant's Signature Date Participant's Printed Name

_____ _____
Signature of Investigator or Designee Date Investigator/Designee Printed Name

Appendix C

Aligning Questionnaire Questions with Research Sub-Questions

What does a clinical instructor do to learn clinical instruction?	What experiences do clinical instructors call upon to help them in learning to be clinical instructors?	What, if any, adult learning principles do clinical instructors use in learning to be clinical instructors?
Questionnaire Questions:		
13. How do you know how to be a clinical instructor?	14. Have you ever taught any of the didactic/lecture part of this university's program or any other program?	20. How much has your teaching technique changed since you became a clinical instructor? If so, why did your teaching techniques change?
17. Do you think that everyone with your credentials can be a clinical instructor? What credentials/experience should be required, if any?	15. Are you a clinical instructor in the same university program in which you were a student?	21. How do you determine if you need to improve or change your instructional technique(s)?
18. Do you think that everyone with your credential should be a clinical instructor? Why or why not?	16. Are you relieved of some work responsibilities when you have a student? How?	24. When did you first use the methods listed in the table above?
19. How much do you think about or reflect on being a clinical instructor (how you teach in the clinical setting)?	20. How much has your teaching technique changed since you became a clinical instructor? If so, why did your teaching techniques change?	27. How do you decide when you need some help or advice on teaching or being a clinical instructor?
20. How much has your teaching technique changed since you became a clinical instructor? If so, why did your teaching techniques change?	21. How do you determine if you need to improve or change your instructional technique(s)?	29. How much do your own experiences as a student affect your instruction?
21. How do you determine if you need to improve or change your instructional technique(s)?	27. How do you decide when you need some help or advice on teaching or being a clinical instructor?	30. How much do your own experiences as an instructor affect your instruction?
22. If you had/have a mentor, was/is it ___ a formal relationship, ___ an informal relationship; ___ no mentor?	29. How much do your own experiences as a student affect your instruction?	31. How much difficulty have you had in learning to be a clinical instructor?

23. What methods did you use to learn how to do clinical instruction (teach students in the clinical setting)?	30. How much do your own experiences as an instructor affect your instruction?	34. What difficulties have you had in learning to be a clinical instructor or learning to be a better instructor?
25. List methods in the table above or other methods you would like to use but have not had the opportunity to use, if any:	31. How much difficulty have you had in learning to be a clinical instructor?	35. Is there anything that you r in order to do a better job of cl instruction? If so, what?
26. If you went through an instructors' orientation or training so, how long was it?	34. What difficulties have you had in learning to be a clinical instructor or learning to be a better instructor?	36. Do you participate in the development/revision of the clinical rotation? If not, would you want to be involved with this? Why or why not?
27. How do you decide when you need some help or advice on teaching or being a clinical instructor?	35. Is there anything that you need in order to do a better job of clinical instruction? If so, what?	
28. If you have read about how to teach better or be a better clinical instructor, which of the following did you read?	36. Do you participate in the development/revision of the clinical rotation? If not, would you want to be involved with this? Why or why not?	
32. How much of what you do as an instructor comes "naturally," without thinking?	37. Have you had experience teaching in another setting, such as a classroom, Sunday school, or Scout meeting? Has this affected your teaching as a clinical instructor? If so, how has it affected your teaching?	
33. Are you evaluated as a clinical instructor? If so, who does the evaluation of you?	38. Have you helped to raise any children? If you have helped to raise children, has this affected your teaching as a clinical instructor? If so, how has it affected your teaching?	

Appendix D
McCown Clinical Instructor Research
Interview Guide

Name of interviewee(s):

Date, Time, Place

Introduction about the purpose of the research, definition of clinical instructor.

Obtain consent. Discuss confidentiality.

QUESTIONS:

1. How did you become a clinical instructor?

2. How much do you think about or reflect on how you teach in the clinical setting?

    a. Do you think about teaching more or less than you did when you started teaching at the bench?

    b. Do you think about different things now than you did when you started?

3. How do you know how to teach on the bench?

4. When you began as a clinical instructor, how prepared were you?

5. How much has your teaching technique changed since you began teaching?

    a. How do you determine if you need to improve or change your instructional technique(s)?

        How do you decide when you need some help or advice on teaching?

    b. What have you changed in your teaching?

        How/why did you change your teaching?

6. What, if anything, were you required to do in order to teach on the bench?

    a. Did you go through an instructors' orientation or training? Was it required? how long was it? Did it help?

    b. Was any other preparation required?

c. Was there anything else that you did to prepare to teach?

7. What are you required to do now that you are a clinical instructor?
   a. Continuing education in teaching, participate in planning the rotation

8. What methods have you used on your own to learn how to teach students in the clinical setting?

   a. What resources have you used, if any, on how to teach better?

9. If you had/have a mentor, is it a formal or informal relationship? [Tell me more about it.]

10. How do your own experiences as a student affect your instruction?

11. How do your own experiences as an instructor affect your instruction?

    a. Have you learned from your mistakes? Can you give me an example?

12. How do you become a better bench instructor or do you even think about it? [Do you think you are better now than when you started?]

    a. When you try to learn to be a better CI, what methods do you use?

    b. How do you assess whether you've really improved?

    c. Have you tried anything where you just didn't learn anything about teaching better?

13. How are you evaluated as a clinical instructor?

    a. What feedback do you get from the evaluation? How do you use the feedback?

    b. Do you do self-evaluation, formal or informal?

14. What difficulties, if any, have you had in learning to be a bench instructor or learn to be a better instructor?

15. How much of what you do as an instructor comes "naturally," without thinking? [things that you might not realize until you think about it later]

    a. List some examples of what comes naturally for you. How do you think you came to know how to do these things?

    b. What does NOT come naturally?

    c. Do you think anybody can be a bench instructor?

    d. Do you think your teaching gets better with experience, either job experience or life experience? [How is it better?]

16. Is there anything that you need in order to do a better job of clinical instruction? If so, what?

17. How does the atmosphere of the lab affect how you learn to teach or teach better?

    a. How much do you talk with each other about teaching?

    b. How much is teaching valued?

    c. How much is learning to be a better teacher valued?

18. If you had a new clinical instructor under you, what would you do with them so they learn to be a good clinical instructor? (What would you have them do?)

19. If I was going to write a description of what it is like to develop as a CI/bench instructor, is there something else I should know besides what we have already discussed?

Please let me know if you think of anything else. I'd like you to read through my description of your experience learning to be a clinical instructor.

APPENDIX E

Statistical Analyses Performed on Questionnaire Data

IV	DV	Method
1Age	17, **18**, 19, **20**, 22, **29**, 30, 31, 32, 35, 36.1, 37.1, **38.1**	ANOVA
2Gender	Chi-sq – NOT USED, too few males	
3	**8**	Correlation
	12.1, 12.2, 12.3, 12.4	ANOVA
	14, 15, 16, 17, 18, 19, 20	ANOVA
	22, 23,1, 23.3	ANOVA
	28, 28.3	ANOVA
	29, 30, 31, 32, 35, 36.1, 37.1, 38.1	ANOVA
8	14, 15, 16, 17, 18, 19, 20	ANOVA
	22, 23,1, 23.3	ANOVA
	28	ANOVA
	29, 30, 31, 32, 35, 36.1, 37.1, 38.1	ANOVA
9	16, 23.1a, 23.1g, 23.3a, 23.3g, 28, 29, 30, 31, 32, 35, 36.1, 37.1, 38.1	Chi sq
11	14, 15, 16, 17, 18, 19, 20, 22, 23.1, 23.3, 28, 29, 30, 31, 32, 35, 36.1	Chi sq
12.5	**15**	Chi sq
12.4	**16**	Chi sq
12.5	**16**	Chi sq
12.3	**23.1d**	Chi sq
12	14, 17, 18, 19, 20, 22, 23,1, 23.3, 28, 29, 30, 31, 32, 35, 36.1	Chi sq
14	15, 16, 17, 18, 19, 20, 22, **23,1, 23.3**, 28, 29, 30, 31, 32, **35**, 36.1	Chi sq

16	17, 18, **19, 20**, 22, 23,1, 23.3, 28, 29, 30, 31, 32, 35, 36.1	Chi sq
18	19, 20, 22, 23,1, 23.3, 28, 29, 30, 31, 32, 35, 36.1	Chi sq
19	20, 22, 23,1, 23.3, 28, 29, 30, 31, 32, 35, 36.1	Chi sq
20	22, **23.1e**, 23.3, 28, 29, 30, **31**, 32, 35, 36.1	Chi sq
22	Not run (too few had a mentor)	
29	**23.1g**, 23.3, 28	Chi sq
30	**23.1h**, 23.3, 28	Chi sq
31	**23.1e**, 23.3, 28	Chi sq
32	17, 18, 19, 20, 23.1, 23.3, 28	Chi sq
37.1	11, **12.4**, **12.5**, 14, 15, 17, 18, 19, 20, 22, **23.1f**, **23.1g**, 23.3, 28, 30, 32	Chi sq
38.1	11, 12, 14, 15, **17**, 18, 19, 20, 22, 23.1, **23.3c**, 28, 30, 32	Chi sq

Numbers relate to questions on the questionnaire

Bold = statistically significant

Appendix F

Open-Ended Question Responses

Q13 How do you know how to be a clinical instructor?

- By knowing how to do my job and by being able to communicate that knowledge to new students. I remember my own clinical experience as a student.
- Review of training checklists and observation of others.
- Self taught? Instruction from SLU very helpful
- St. Louis University supplies student objectives as guidelines
- Although I've never had any formal training in the educational arena, I feel I am a good instructor. I try to put myself in the shoes of my students and make them feel like they are not an after thought. I have 24 years experience in Toxicology so I definitely "know" the material. I've always trained new hires in my department. We also do a lot of manual testing of "hands-on" chemistry/extractions. Theory is something we are aware of on a daily basis.
- Workshop (ICARE). Learning from coworkers while they instruct students
- I draw upon my experiences as an intern myself. Also I use the experiences with instructors at NIU and the teaching class we had taken as part of the curriculum.
- No training
- Remembering how I was taught and trained on how instrumentation, observing others
- I just teach what to do every day. With students it's very much the basics, and techniques.
- Training, competencies, observing other teachs
- By drawing on previous experience + knowledge you can instruct using a combination of academic + practical information. Being asked questions that I don't know the answer to makes me do research, so both student + teacher learn.
- I also teach microbiology at a community college (CLT program)
- 36 years of experience, observation of others teaching, we have criteria which we teach, demonstrate, then observe the student. Students need procedures - answer questions - we discuss
- Just teach what I know and try to incorporate classroom instruction to workplace
- Given a set of objectives from the school instructors - From that I set up guidelines for other techs to follow. I am in charge of the rotations.
- Study the topic, teach it to a basic level (if needed)
- O.J.T., practice, eliminate what doesn't work
- By watching others teach. By reading a provided outline
- Practice makes perfect
- Guidelines that we follow. Specific checklists to cover all items that need to be taught.
- I believe teaching in something you can or can't do. I'm always enjoyed it and have a real knack for explaining my job in a way that people can understand it no matter what background they have before I teach them. I guess I really enjoy

showing people what I do and how to do it.

- Through experience in various areas as well as a requirement in a supervisory setting.
- Teaching biology, chemistry and physical science to high schoolers. Teaching assistant in animal physiology to college students
- Comes naturally. Likes to teach
- I'm just using my experience as a mid tech and remembering what helped me when I was a student.
- Through observation of peers and from my clinical instructors.

Q17 What credentials/experience should be required, if any?

- Over-regulation will make it harder to get teachers.
- MT (ASCP) credentials and ability to be patient with students
- MT (ASCP), CLS, or enough experience
- 2-3 years experience in my field
- More clinical experience
- Training or special class
- Should have to have interest in teaching experience in program other team one trained in
- Must be able to speak English + Explain things! Must have some experience doing whatever they will be teaching
- We all have 4 year degrees so we all are equally qualified to teach.
- At least BS in CLS and 5 yrs experience first
- Degree, Certification, 1 year experience in area of instruction
- I think instructors should have a four your degree and 3 years experience in a clinical setting.
- Naturally, a clinical lab science degree plus several years of clinical experience. After all, the goal of clinical rotations is to teach real life situations the book doesn't
- Good communication skills, organization + social skills
- I don't think it's a bad idea to provide a lecture series for those instructing students.
- The instructor should have at least an MLT to be training MLT/MT
- They should want to do this, and not be forced to teach
- Ability to teach and willingness to teach. Some techs feel they have to put of their job description
- MT (ASCP) or equivalent
- A bachelor's degree in sciences with at least 1-2 years of experience in clinical laboratory
- A few years experience in area of instructing
- Knowledge of the subject
- To be able to bring the material to a basic level (if needed)

- Need to be knowledgeable/ + people person
- Need to be very experienced and confident in area you are teaching
- Degree in US
- You should be a clinical laboratory scientist but you should love the desire to do it as well.
- Direct clinical laboratory experience!
- 2 years experience at the bench and above average evaluations.
- Any medical technologist should be able to teach students

Q20 Why did your teaching techniques change?

- I learned to make sure to document.
- University standardized the exams
- I don't spend as much time on the mechanics of the analyzer - the students became bored.
- Things change, technology changes, students are "different" these days! (LOL!) Very "test" grade oriented.
- With experience, I learned more about initiating constructive conversation and how to bring out thought processes so the student could think through a subject and not just memorize end results
- Workload has increased - must do work + teach at same time. No prep time given to prepare to teach.
- I gaining more confidence the more I taught and the longer I worked here the more experience I gained as well.
- I've learned best ways of teaching and training so that the student is able to learn. I think I learned how to do a better job with changing your teaching techniques
- Methodologies become obsolete + replaced
- NIU workshop
- Because teaching a clinical subject and explaining it as you perform a test makes you more aware of techniques and knowledge of the task.
- I realized that students learn by doing. In this field hands-on is crucial.
- Lack of time and support.
- Advice from SLU
- Extra instruction from St. Louis University
- I started thinking about it from the students' perspectives. I now take morning/lunch breaks with them and put more effort into it.
- I had to become a little more flexible.
- My technique changed after working in this field for a year or so. My confidence level increased and felt that I had gained enough experience to thoroughly explain our testing methods.
- Over time you learn what works better with people
- I had to change depending on the student. Some students understand and follow instructions whereas someone slower to understand and follow.
- Feedback from students + co-workers

- Being a clinical instructor, you have more exposure on the practical application of what you teach.
- With experience, you learn which techniques work.
- We used to have more time for 1 on 1 teaching as we have gotten busier in the department, students have had to work a bit more on their own. WE no longer allow students to turn out results while an instructor observes, so we give students more samples that have already been completed for them to work on more independently.
- Work load increased. I have added hematology case studies for independent study.
- Yes. Try to improve continually
- Experience taught me what to cover what not to cover
- I felt more confident in my knowledge + could work while speaking with the students
- I reflect more on the students questions + make sure I have the answer
- More experience; more practical knowledge picked up
- Always looking for improvement. Feedback from previous students
- Through trial and error

Q20 How did your teaching techniques change?

- Added extra problems to practical exams, gave more on handouts.
- Less lecture and theory
- Now more time on case studies and observing the analyzer in real time.
- Organized, added computer based sites, lectures/info for reviews. Flashcards for terms.
- More patience; better listening. Learning to wait for an answer (accepting silence) instead of continuing on and giving the student the answer
- Just do the best you can now - depends on the day now. Much time you can spend with a student
- They changed with the more experience (gained)
- This is difficult to answer. I seemed to learn what worked and what didn't and tried to teach using what I learned from experience.
- Dry old information + include the newest information.
- More styles of teaching available, depending on your students learning style. More theory materials given. Schedule made for rotation.
- I had to realize that students have little knowledge of clinical tests and basic info needs to be given to them before they understand to true outcome. Basically slowing down and just be more thorough.
- More about me than the students I learned that I need to step back and let them do it.
- Less review of theory and clinical information on patient.
- Better introduction/orientation on 1st day
- Became more compassionate to the students circumstances

- It has helped tremendously to have their homework assignments provided to me. I make sure I have those answered if they need help or at least am able to provide them with the reference material to find it on their own.
- To improve my outcome for the students sakes
- I was more thorough with my explanations and I "tested" the interns instead of just telling them everything I was doing.
- How to be clearer in what you explain
- I paced myself with the student - as not to overwhelm them.
- More hands on
- I have a better way of expressing myself and easier ways of explaining the theoretical part if I don't get an interaction from my students
- Try to involve the student in the learning process (active learning)
- I've tried to let the students have more responsibility for learning the theory on their own and just teach procedures
- I've added manual testing ie - urines, Retic etc for the students.
- Using different visual methods, to bring the point across
- I've tried to improve, but I'm not comfortable with the teaching, but do best I can because it's part of the job
- I became faster + more to the point
- More patient and listen
- Little more organized; work off the students, see how they are following the teaching.
- More individualized focus in an interpersonal setting.
- I've had to simplify tasks and teach less detail

Q21 How do you determine if you need to improve or change your instructional technique(s)?

- Feedback from employers, past + current students, co-workers of grads, performance on certification exam + exams during the school year.
- Student comments, test grades, certification exam scores
- Test results. If students can answer questions. Their feedback at the end of the year. Test results.
- The amount of yawning and the number of questions asked.
- If students can't pass a test then I didn't show them what was needed.
- Feedback from student
- 1. Student interest level 2. Technology change 3. Hear or see something interesting to try
- Student feedback, Student grades
- If some new info or if can see student not grasping how you're explaining.
- Feedback from students, fellow employees, university staff
- If I knew something was working with how I'm trying to explain it I would find a better way to explain it by reading more about the subject or confer with my colleagues.

- Questioning students and using their feedback, how well they did on exams. Primarily feedback from students and how well they did on the exam.
- Student feedback, exam performance
- Based on feedback from student
- Feedback from the students. Some are more interested than others so they are easier to show abnormals to
- If the student does not appear to understand what I am saying, I change my style

- When a student needs to keep asking the same question or when they are quizzed on a subject and they are missing the basic theory of a subject.
- I try to reflect on whether my students were allowed and able to successfully perform the duties assigned to them.
- No assessment
- By the look on the students face and that student's confidence level as we work specimens. I also ask the students what they think and if it makes sense to them as we go along.
- Blank stares or lack of answering questions correctly. Also if they cannot perform the required tasks on the bench.
- Evaluation from students. Advice from co-workers
- Review of student evaluations
- I try to quiz them along the way if they aren't able to answer my questions I know I've lost them somewhere.
- I base it on the student's reaction & learning.
- Feedback from the interns is my best way of telling if I am getting through to them. I ask if there are any questions or if there is something that is confused them.
- Based on comments that the students give their feedback.
- If student seems confused then I ask what would help them more.
- I observe the student and assess them comfort level. E.e. are they able to make dilutions and figure out how to + how much to make, etc.
- Feedback from students + co-workers
- I base it on how well students understand theory and can apply it to actual practice. If by the end of the course they can think on their feet and function well in the clinical lab
- If I don't any interaction from my students
- If the student is confused, try a new tactic.
- If a student is having more difficulty, or has a better knowledge or understands more quickly than most - some students need more repetition - I try to vary with the individual student in mind. My co-workers and I may discuss ways that we can help a student.
- If the student doesn't understand, I try a different approach.
- Self analysis of performance of my perception of students comprehension + level of interest
- If students aren't grasping our area I try to be creative with projects.

- Degree of difficulty of the topic. Audience level. Learning response
- If the students seem confused or ask questions that indicate they aren't understanding the concept.
- We are reviewed by each + everyone of the students we teach
- Just came with experience
- If I feel the students mostly are not understand how I'm doing/or explaining something
- By observing the students; do they maintain interest/eye contact; Are logical/intuitive questions being asked?
- I always ask my students if they learned anything new that they didn't know before and were they satisfied with the instruction I gave them.
- Using both positive/negative feedback. Observing results from previous students.
- Feedback
- When students don't understand what you are saying or trying to get at
- I will use feedback from my students
- Trial and error

Q22 If you have a mentor, how did you get a mentor?

- Previous Supervisor
- Assigned
- By admiring her work and watching her
- Most of my mentors were either techs that I admired or supervisor.
- It was one of my trainers
- She was my supervisor at my first med. Tech. position
- Friend
- Supervisor + techs who have taught more, helped me learn how to be a better teacher.
- By working alongside my co-workers
- She was my boss/supervisor.
- Through my job training for a position she already had.

Q23 Other method used to learn

- Advice from educators outside the lab who teach college students
- Reviewing pertinent material
- University student expectation list
- Just forcing myself to do it
- Taught phlebotomy at community college
- Visual presentation
- Going over materials on my own so I don't say the wrong thing

Q25 List methods in the table above or other methods you would like to use but have not had the opportunity to use, if any.

- Going through instructors' training. Going to class/symposium on teaching.
- Going through an instructor's orientation/training. Going to a formal class/symposium on teaching
- Instructors orientation. Class/symposium on teaching
- Instructor's training
- Going to a formal class on teaching.
- Reading about how to teach
- Instructor orientation/training
- What about some sort of on-line teaching symposium?
- Reading materials - which I had not thought of instructors' orientation/training
- Tools on student instruction. Visual means for instruction
- An orientation would not be bad It would only improve teaching methods
- Instructor orientation
- I would like to have more formal training in teaching provided by my instructor or at least attend a workshop on the topic.
- Going to a class on teaching

Q27 How do you decide when you need some help or advice on teaching or being a clinical instructor?

- As situation arises
- When information retention is poor for more than one student.
- Haven't had many problems teaching
- When they ask a question I cannot answer.
- Talk to the education supervisor (Nancy)
- Had a "difficult" student issue. Saw that we just could not teach like "before" with the time constraints/manpower issues of todays lab
- If the student is having trouble + I've tried everything I can think of
- I took over the teaching responsibilities when the person who did the teaching retired.
- When I don't know what I'm doing or have to ask
- Negative feedback from student appraisals
- I was new to this and wanted more guidance. (so was our facility)
- When a student is just not "getting it"
- When I don't feel the confidence I would like to have or when a student stares blankly like they have no idea what I'm talking about, (thankfully that hasn't happened often, but most embarrassing is when they ask questions and I don't know the answer
- Don't
- When a student is having problems learning.

- When the student asks a question that I cannot answer.
- When student is struggling
- Self-evaluation
- I think you know if you are a good teacher or if you are not by reading the students. Also, you need to figure out how your student learns best.
- I base that on my students' success in understanding the material
- When I find out that my student was confused or unclear about a subject or task.
- If I have any questions
- Ask co-workers
- When students do not understand what I am teaching

- If student appears to be struggling under my teaching, (not understanding how to apply basic principles, not grasping basic theory, etc…)
- After teaching the same class from quite some time (like 2 months or so) if I don't get a good interaction from the students (90% of them didn't do well on the tests)
- Problems with the student learning a task.
- When I am teaching something new, when we have gotten students from a different school with different requirements.
- Ask other techs
- When a question is asked by a student I have not thought of or don't know the answer to - then I ask my pathologist
- If the students are understanding what I'm showing or explaining to them.
- When students look consistently bored or confused.
- I will ask a coworker their approach and incorporate it into my own.
- Result evaluation
- When the student has a hard time learning or catching on to SOP methods
- If a student doesn't seem to be "getting it"

Q32 List some examples of what comes naturally for you, if anything

- Using visual aids-graph, diagram
- Covering procedures in step by step method.
- Being excited about my job
- Teaching instruments
- I am an organized person and enthusiastic. I have had years of experience with students +new hires + developed a sense of what works+ what doesn't. I like to make "Lab" interesting + use" teachable moments" even when they might not be in "the plan" for the day.
- My best skills are in encouragement and the importance of being a med tech. Correlating theory with practice is a valuable skill to enable students to know why they needed to learn everything even though a lot of the testing is now automated!
- Encouraging students, demonstrating, creating teaching scenarios, being patient, correlating theory with practice

- Demonstrating, Correcting student technique
- I created 3 student teaching manuals and revised our master teaching manuals
- Encouraging students, patience, modeling professionalism
- Demonstrating, correlating theory with practice
- Questioning, encouragement, being patient
- "Dumbing down" hard topics
- Simplifying a difficult task to make it work better & technique.
- Demonstrating everyday techniques and procedures
- Demonstrating + explaining tasks. Questioning + encouraging students. Organization + prioritizing. Being positive.

- Review the checklists first, get to know the student a little, follow the procedure with them following it with a paper copy. Explaining as you go why you are performing the tasks and how to properly perform all aspects of the procedure. Review the normal ranges and abnormal results, what to do with them and how to report. Then go into why the test possibly is being ordered and the diagnoses that can be expected. I have the student repeat a mock test scenario in most cases and see if they remember the procedure. Also, asking what a result could possibly mean to the doctor in terms of a diagnosis or prognosis is a good tactic.
- Mother of 2 grown children
- All of the above! I also believe you should never assume a student has laboratory skills (eg. Pipetting)
- Questioning, encouraging, demos, correlating theory & practice, practical questions
- Demonstrating, being patient, correlating theory with practice, questioning students
- Encouraging students, demonstrating, modeling professionalism, being patient
- Questioning students for comprehension, Encouraging students to practice good techniques. I've been told by the students that I teach well.
- Setting up situations for student to work their way through. Examine their "problem solving" ability, Being patient, Intermingling theory with practice
- Questioning students, correcting student technique, correlating theory with practice, being patient.
- Patience, demonstrating, instructing techniques
- Planning for instruction, questioning students, encouraging students, demonstrating, correcting student technique, modeling professionalism, being patient.
- Questioning students, encouraging students, demonstrating, modeling professionalism, being patient, correlating theory with practice, evaluating students
- Being patient, Correlations theory with practice, encouraging students, questioning students, creating teaching scenarios, life's experiences - ie - past phlebotomy, experience + patient contact
- Planning for instruction, questioning students, encouraging students, demonstrating, modeling professionalism, being patient, correlating theory with

practice, evaluating students, etc.

- Planning job + teach time, encouraging students, demonstration, correction (positive!), on own do scenarios, all the hands on stuff is great, safety!, patients stronger every time I teach when it comes to theory
- Daily practices, Very familiar with component preparation/Everyday work situations and preparations.
- Changing the order of teaching; Asking questions to keep students awake/interested
- I'm just really good at explaining what I'm doing and make sure the students are absorbing what I'm saying by having them do observed tests for me.
- I use all of the above examples.
- I have used most of the examples you have listed. My ability to build a rapport with the student has been invaluable.
- Encouraging students, being patient, correlating theory with practice
- Encouraging students, questioning students, modeling professionalism, being patient
- Questioning students, encouraging students, demonstrating, correcting student technique, theory with practice

Q34 What difficulties have you had in learning to be a clinical instructor or learning to be a better instructor?

- None
- Dealing with uninterested or hostile students
- Have to keep patience
- Updating my own education
- No difficulties other than the time factor
- I had to learn to organize and condense my lecture material.
- Time available to prepare and teach students without being dragged into daily or bench work
- With ever increasing workload + decreasing staffing getting a "pared" down plan + yet feeling we adequately cover topics has been a challenge. Also, getting staff to "buy into" a "simplified" plan has been a challenge.
- No time
- Communication - being able to explain something that is understandable to the student.
- Trying to explain something to a student. i.e. getting a concept in terms they can understand. Confidence in myself. Learning the difference between what they actually need to know. I'm inclined to give the students way too much.
- Time to do so
- We make up the teaching supplies here. It would be better to have packets supplied to us to know what exactly we need to go over to enforce the book knowledge of the individual student.
- Slowing down my work flow, patients, and explanation of testing.

- Keeping up with new methods
- Just trying to get through all the material and keep up with workload at the same time.
- Time to do a good job, especially in the more manual areas
- There is little support from laboratory management to make clinical instruction important
- Time management has been the biggest problem. We are a small department and the work volume does not slow down just because I have a student!
- At my present job, it is hard to allow enough time to teach when our workload is very heavy. I feel that often we have to give the student a project to work on separately so that we can get our work done.
- None
- The biggest difficulty is in keeping up with all the benchwork and teaching at the same time. Although if one of us is teaching, others try to help with the workload.

- It is hard to do your normal duties of work and teach students. In my work, many times the students take the back seat. I regret this because it is not fair to the student. I personally had great instructions and a great experience as a student and I know my student is not receiving the same benefits.
- Some student's language barriers
- Not enough time to plan or stick to an orderly schedule when teaching is mixed with doing routine work in a busy blood bank.
- Having a few students that's somewhat difficult to handle the first time I took this responsibility
- Trying to do my regular tech work as well as being an instructor
- Knowing the material well enough to explain it.
- having to turn out work in timely fashion while teaching.
- On occasion we have a student who thinks they know more than you do. A student who uses this field as a stepping stone to medical school etc. can be difficult at times.
- Providing visual aid
- I'm not a natural "teacher". Public speaking scares me. So I am better on the benches that teach "how-to" instead of just relaying information
- Just multitasking or explaining + having nothing the students can do to connect it.
- Just rethinking why I do what I do
- No formal training, usually just 'wing it'
- I've had to try to incorporate hands-on experiences in some settings that aren't as workable as others.
- I'm still pretty new at it. I think I just need more practice.
- Sometimes too much detailed information is taught. I have had difficulties in simplifying things.

Q35 What do you need in order to do a better job of clinical instruction?

- Time
- Help when workload is too heavy to give the student the necessary attention
- Relief from some work responsibilities as teaching disrupts the work flow.
- More time, less stress
- A feeling or commitment from administration that what we do to train the students in valuable + "in the plan"/vision " of our institution - not just another thing/task to do on daily basis. There's no recognition mention, from manager or admin.
- Better skills to do a more accurate evaluation
- Not have to cover bench(s) same time as teaching
- Training, More time
- Patience
- Time, educational materials
- Off-bench time
- More time

- We make up the teaching supplies here. It would be better to have packets supplied to us to know what exactly we need to go over to enforce the book knowledge of the individual student.
- More time when I am not also trying to complete my own benchwork besides teaching
- More time
- Support and instruction & training from lab management
- I would love a weekend seminar on "teaching" in general.
- Time away from clinical work
- More "quality-time" with the student so that we can properly instruct and also allow the student to perform the tasks.
- Written material from university about what they want us to teach and what we should be doing with the students.
- Off-bench time
- More time only with the student without bench duties.
- A higher workload
- More knowledge will always improve your ability as an instructor. More time to plan an orderly schedule
- I need to attend seminars or continuing education classes of sort (?), more often.
- Tools for teaching. Internet site for teaching tools.
- More time to explain, less work to perform in the clinical lab (less stress)
- More help at certain times (work vs teaching)
- I am blessed with great teachers who do a good prep job before the students arrive
- More visual aids
- Workload plays a large part in how well I teach. If I'm stressed about what is piling up while teaching, I do a poor job of teaching.

- If we had an entire day with students + didn't have to worry about patients we could go through + let then actually do the tests for more experience.
- Enough support staff with me in component prep., so I can teach the student without area getting to busy and I can't explain everything in detail like I would like to.
- More time to prepare for students
- I think I have the tools I need
- Keeping current with new instrumentation and testing
- Perhaps a class or formal training

Q36 Why or why not would you want to participate in the development/revision of the clinical rotation?

- I just don't have the time.
- Not sure what it would entail
- Not sure, probably NO because of time limitations.
- Time constraints
- That way I could know what to focus on.
- This is a small hospital with great staff. Any suggestions are easy to talk about.
- Because I believe the educational institution should set there guidelines
- My bench-level view of the situation is not necessarily known by management
- I would not know how to go about it
- I would be helpful to know what the university's goals are, as well as their teaching schedule, so we could coordinate their theory with own practical teaching.
- As a group we talk about what works or changes to make
- I'm vested and supportive of the clinical science/laboratory future & want to support future technologists
- The med tech school adequately sets the clinical rotation for the students.
- Not sure I'd be very much help since I have little experience with it.
- I only want extra work if it comes with extra pay.

Q37 How has teaching in another setting, such as a classroom, Sunday school, or Scout meeting affected your teaching?

- Not much in common with kindergarteners.
- Different types of teaching experience
- All are teaching opportunities. The main thing is to learn patience and understanding of different people's learning styles.
- Flexibility! Organization + realization it is a TEAM effort, not just the instructions.
- Being able to be versatile

- I suppose you learn if your method of instruction has sunk in by seeing the students projects + reading their faces.
- Confidence. Patience
- I drew on my experiences from teaching a dog education course and applied it to clinical lab demonstrations.
- It has given me practice in teaching students.
- Positively
- Feel more comfortable due to experience in a teacher/student situation
- Patience, Work areas to stress, teamwork
- To find which student need more attention, or who is struggling
- Taught same age as students, helps relate
- Just more comfort in front of people
- Helped me figure out the most effective way to teach and being time efficient at the same time.
- Learn to work with a variety of personality and age groups
- In a positive way, I know how to hold individual attention due to these experiences
- In a classroom setting, you learn to have much more patience in most instances as well as to individualize your approach to students
- My previous teaching experience allows me to make students comfortable enough to ask questions about the material being presented.
- Experience
- I will better plan next time. I can set up practice activities.

Q38 How has raising children affected your teaching?

- I gained insight into motivation, study habits, grade stress. I'm probably more patient.
- I realize I'm not their peer. I do not try to be a buddy so they like me.
- You have to have patience.
- All are teaching opportunities. The main thing is to learn patience and understanding of different people's learning styles.
- Flexibility + organization - again. Lab folk, by their nature are task oriented and sometimes cannot see the BIG picture. We get caught up in trivial issues. With raising kids 2 have learned you cannot control all aspects of time. You teach basics, give responsibility + hold accountability on tasks given
- Can relate to someone of similar age as child
- Patience - asking questions to see if they understand. Being a role model.
- I am more patient with people.
- Being more patient and realizing that for most students this is the first time they have been in a clinical setting and know nothing about the clinical happenings.
- I had never thought of it that way, but I don't generally talk down to either my children or my students
- Helping me to have patience and to approach things from more than one angle.

- I suppose raising children is similar! You are their teacher.
- Better understanding of different learning styles and meds (2 children with ADD)
- Developing patience
- Much more patient after I had my children.
- It gave me more teaching experience, especially with teenagers/young adults
- Patience, thinking how to explain things
- Yes – patience
- To be compassionate
- Filter out the unnecessary information, better "step-by-step" teaching
- Being patient
- More patience
- Patience and the ability to break things down into something simpler
- My children are older, but you never stops trying to give them tools to succeed.

Appendix G

Questionnaire Open-Ended Question Responses Tally GROUPED

#13 How do you know how to teach?

I do not know how to teach	3
Experience from teaching or training	11
Experience from teaching 6	
Training new techs or as if they were new techs 2	
Teaching elsewhere 2	
Being asked questions 1	
Input from teachers who trained elsewhere 1	
Experience as student	8
Observing	8
Follow checklists/teaching guide	7
Work experience	7
Understand the work completely 4	
Do the job and explain it 3	
Common sense, comes naturally	4
Workshop or course	4
Workshop or course 3	
A teaching course during undergrad program 1	
Internet reading	2
Life experience	1
Consulting with the university	1

#20 Why change

Gained experience	9
Gained experience 5	
Developed confidence 3	
Realized what not to cover	
Things changed	10
Lack of time, increased workload 4	
Technology changed 2	
University standardized the exams	
Had to become more flexible	
Need to document	
Students change	
So students will learn better	7
Had to adjust to different students	
So student will learn better 2	
Students were bored with mechanisms of analyzer	
Had to cope with students who are test-grade oriented	
To help students think through things	
Started thinking about it from students' perspectives	
Feedback from students	2
Advice from others	4
Advice from course or university 3	
Feedback from coworkers	

#20 How changed

Resources used

- Give more handouts
- Give more case studies
- Added Internet sites
- Added flashcards
- Use of visual methods

Method of teaching

- Step back and let student do it, real time instrumentation 4
- Added independent learning activities 3
- Slow down my instruction, don't overwhelm them 3
- Individual instruction for different students 3
- Added problems to practicals
- Made schedule for rotation
- Better intro/orientation the first day
- Don't give students the answer right away
- More clear explanations
- Better getting quiet students to talk
- Became faster and more to the point
- More organized

Content changed

- Teach less theory 3
- Include new information
- Less clinical information on the patients
- Simplified, less detail
- Added manual tests

Attitude changed

- More patience 2
- Better listening 2
- Make sure to have answers 2
- Be more thorough 2
- Spend as much time as I can with student
- More compassionate to student
- Ask instead of tell
- Reflect more on students' questions

#21 How determine if you need to improve/change instructional techniques

Direct feedback from students
- If student can't answer questions, doesn't understand, can't do 24
- Student interest level, yawns 3

Indirect feedback from students
- Feedback from students and student evaluations 20
- Exam scores, certification exam scores 9

Feedback from others
- Feedback from fellow employees 4
- Feedback from employers/coworkers of graduates 2
- Feedback from the university 1

Changes in field or teaching
- New information, technology changes 2
- Hear of something new to try 1

#27 How do you decide when you need help or advice

Haven't needed help or advice 2

Direct feedback from students
- Student is not getting it, not retaining it 15

Indirect feedback from students
- Negative student appraisals 2

Self-evaluation 1

Feedback from others
- Ask coworkers 3
- Going to a class on teaching 2
- Go to the education coordinator 1

Need to solve a problem
- Students ask questions I can't answer 4
- Difficult student issue/situation 2
- Couldn't teach like before due to manpower issues 1
- Getting students from a different school 1

#34 <u>What difficulties learning [what do they need to learn]</u>

None 3
- Just wing it

Institutional barriers
- Time to teach 12
- Time to prepare
- Lack of support for instruction

Lack of teaching skills
- Condensing 3
- Dealing with hostile/uninterested students 2
- Being patient
- Organizing
- Explaining
- How to reinforce book knowledge
- Slowing down to explain
- Just need more practice
- Providing visual aids
- Not comfortable "public speaking" even one-on-one

Difficulty with bench-specific teaching
- Rethinking why I do what I do
- Having nothing the student can do to connect it
- Try to provide hands-on experience in some settings that aren't as workable

Knowledge
- Knowing the material well enough to explain it
- Keeping up with new methods/info 2

Student language barriers

Appendix H

Aligning Interview Questions with Research Sub-Questions

What does a clinical instructor do to learn clinical instruction?	What experiences do clinical instructors call upon to help them in learning to be clinical instructors?	What, if any, adult learning principles do clinical instructors use in learning to be clinical instructors?
Interview Questions:		
1. How did you become a clinical instructor?	3. How do you know how to teach on the bench?	1. How did you become a clinical instructor?
2. How much do you think about or reflect on how you teach in the clinical setting?	4. When you began as a clinical instructor, how prepared were you?	2. How much do you think about or reflect on how you teach in the clinical setting?
3. How do you know how to teach on the bench?	5. How much has your teaching technique changed since you began teaching?	3. How do you know how to teach on the bench?
4. When you began as a clinical instructor, how prepared were you?	10. How do your own experiences as a student affect your instruction?	4. When you began as a clinical instructor, how prepared were you?
5. How much has your teaching technique changed since you began teaching?	11. How do your own experiences as an instructor affect your instruction?	5. How much has your teaching technique changed since you began teaching?
6. What, if anything, were you required to do in order to teach on the bench?	12. How do you become a better bench instructor or do you even think about it?	6. What, if anything, were you required to do in order to teach on the bench?
7. What are you required to do now that you are a clinical instructor?	13. How are you evaluated as a clinical instructor?	8. What methods have you used on your own to learn how to teach students in the clinical setting?
8. What methods have you used on your own to learn how to teach students in the clinical setting?	15. How much of what you do as an instructor comes “naturally,” without thinking?	12. How do you become a better bench instructor or do you even think about it?
9. If you had/have a mentor, is it a formal or informal relationship? Tell me more about it.	17. How does the atmosphere of the lab affect how you learn to teach or teach better?	13. How are you evaluated as a clinical instructor?
12. How do you become a better bench instructor or do you even think about it?	18. If you had a new clinical instructor under you, what would you do with them so they learn to be a good clinical instructor?	14. What difficulties, if any, have you had in learning to be a bench instructor or learn to be a better instructor?

13. How are you evaluated as a clinical instructor?	19. If I was going to write a description of what it is like to develop as a CI/bench instructor, is there something else I should know besides what we have already discussed?	15. How much of what you do as an instructor comes "naturally," without thinking?
16. Is there anything that you need in order to do a better job of clinical instruction? If so, what?		16. Is there anything that you need in order to do a better job of clinical instruction? If so, what?
17. How does the atmosphere of the lab affect how you learn to teach or teach better?		17. How does the atmosphere of the lab affect how you learn to teach or teach better?
18. If you had a new clinical instructor under you, what would you do with them so they learn to be a good clinical instructor?		18. If you had a new clinical instructor under you, what would you do with them so they learn to be a good clinical instructor?
19. If I was going to write a description of what it is like to develop as a CI/bench instructor, is there something else I should know besides what we have already discussed?		19. If I was going to write a description of what it is like to develop as a CI/bench instructor, is there something else I should know besides what we have already discussed?

Appendix I
Horizonalization of Flo's Transcript

	Horizons/Statements: (with transcript lines)	Comments:
	18, 487Was told teaching was part of job as assistant supervisor	
	27Most techs do not teach	
	30-33Thinks about/reflects when she needs to come up with a plan for an individual student	
	31At home thinks about ways to teach some students	
	35Examples of individualization	
	46Learning to read the students is a natural thing, you get a sense	
	53Learning to read the students is a natural thing that came on the more I had students	
	55 Some of them I've found a language barrier	Relevance to learning to teach?
	57-60Let's students determine what they will do, even to their detriment	
	63Thinks about teaching less now than when she started because she's more used to it	Novice/expert?
	66 3-4 students back to back burnt her out	
	68Doesn't think about teaching cause I do mostly the same things	
	69Thinks about it, goes to bag of tricks, if student is different	
	76Thinks about changes she needs to make to content because of new things	
	79She knows how to teach by how the student is doing	??
	80I did not have a mentor. I didn't really have someone to show me.	
	82,92At first she had some books and materials on subject matter (not teaching) and some study questions	
	84She revamped the study questions as they were old fashioned	
	87She is self-taught	
	96She was given a checklist of what to cover which was developed by previous clinical instructors	
	105FHOSP had a hospital-based MLS program of their own before Flo worked there	
	116She was not very prepared at all when she began teaching. Her first students were nerve wracking.	
	117If her students don't flunk, then she has taught them something.	Low expectations?
	121Thinks her teaching technique has changed a lot now that she is used to what she is going to teach	

	123She's looser now (more flexible)	
	130She determines if she needs to improve or change instruction based on how she reads the student. If they are having trouble she changes techniques	But does she seek a NEW technique?
	139If the student is having a lot of trouble, you want to work on them with that and see what they're lacking or what they're not getting	
	153Gets advice or help only with content	
	146Gets help on content from a very knowledgeable coworker	
	165She has changed content to include new information	
	168,180She used a variety of teaching tools, handouts, historical patient data, things that students may not see elsewhere	
	183Changed her teaching materials to make it easier for herself and so it works better for the students and because the materials were outdated	
	187Likes that the university gives the students and the hospitals the study questions so she can go over things the students have questions about	
	199Was not required to do anything to be a clinical instructor, it was part of the job as assistant supervisor	
	~~209At the beginning, she was given a packet of material (content related)82,92duplicate~~	duplicate
	207At the beginning, she boned up on content	
	220At the beginning, she had no preparation to teach	
	229She does continuing education but nothing related to teaching	
	233She has helped plan the blood bank rotation and feels that this helps her as she is also the one who teaches	
	237On her own, she has used trial and error to individualize her instruction	
	241She has not taken any courses or read any information on teaching because she hasn't felt a need to	Her survey said she did read
	254As a student her clinical instructors were paid extra to teach and were just teaching to get the money	C said that CI should get incentive
	264,276When she was a student, the clinical instructors were not interested in bothering with students and she did not want to see herself doing the same	
	266I can put it on my resume and on my evaluation that I teach, but really I like to teach	
	270Not wanting to bother with students bothers her because these students are people we are going to hire, hopefully	
	284Her own experiences as an instructor hopefully has made her teaching better	

	288If she has patient work, the student will be pushed aside. She will try to find something for the student to do but she can't promise	
	291She wishes that she had a clone in order to cover the bench and teaching	
	293Even when you are busy the student can learn from just watching, what's going to happen, you need to be organized, you need to pay attention	
	296To teach better she needs less work and/or more time	
	301This lack of time/conflict of bench work and teaching is not going to get better	
	303Some techs are going to ask why they should be bothered with students, 569	
	304We need students because we are going to need them to be techs later on	
	311She feels that sometimes she is too soft, that students take advantage of her. She takes students' excuses at face value. In the end it affects the student's performance.	
	325Attendance is her biggest problem. She has not had problems with cheating.	
	334Sometimes students argue for points and she doesn't know if they are looking at the big picture, really learning something, or if they are just out for a grade.	
	337Some instructors will be battered down and give the better grade	
	338Student may not be really learning if they are just spewing information back at you. This can't help them in the end.	
	347She does not really think about becoming a better bench instructor	Thinks about students
	350If she comes across something that works or a good example, she'll keep that in her bag of tricks.	
	356When she tries to learn to be a better clinical instructor, she goes online to find out more information or more about a blood bank technique.	
	362She finds it hard to assess whether she has improved as an instructor because, although students fill out evaluations for the university, she rarely sees them.	
	365She must be at least staying the same or improving because nobody has come to her and said that her students aren't passing or other issues.	
	383When she does see the evaluations, she remembers the things that they mention as being helpful.	

	389When teaching blood bank, you can't duplicate some of the things that would be good for the students to see because it might not come in while the student is in the department.	
	391When she has something that the student should see, she offers to show it to the student even if the student is in a different department.	
	401She does not do self-evaluation	Doesn't realize that she is?
	405A difficulty that she has had in learning to be a better bench instructor is being patient with everyone while teaching students and getting her work done.	
	417,428Teaching comes more natural now	
	418Being organized, multitasking come naturally to her	
	421Teaching is like public speaking, at first it's kind of unnerving.	
	423Now it's a lot easier because she has a spiel	
	429She feels like she is a leader and can give students direction, like to organize them	
	437Teaching comes naturally to some people	
	438Some people can be really good techs, have the same credentials but aren't very good teachers	
	439,446Some techs who are really good teachers don't like to teach. They say that they don't think they are good teachers and are not interested.	
	453Going over students' mistakes and correcting them does NOT come naturally. Their reactions are hard to deal with.	
	466Not everyone should be a clinical instructor because they are not patient enough or willing to work with the students	
	469Some techs shouldn't teach because they need to focus and having students would be a distraction	
	473She thinks people can learn to teach but they shouldn't if they don't want to teach. Students will pick up on that.	
	477Just because you could teach doesn't mean you should	
	499Invite techs to teach but no one has volunteered in the last while	
	514Job experience is going to make you a better teacher because then you're going to have more knowledge to pass on	
	516Life experience helps because it depends on how you feel about you and yourself and what's going on as to what you are going to put into your teaching	

	525In order to do a better job teaching, she'd like an assistant	
	528Sometimes trying to teach and trying to do your work you are going to short something and you don't want to short the patient.	
	539They have a lot of people getting ready to retire and that affects the atmosphere negatively.	
	541She tries not to pass on negativity to the students but they hear it from other techs	
	549Hopefully as long as it's not too negative it's gonna pass along something to them later on when they're out in the real world and working. Hopefully they'll learn from it.	
	563If you have a negative environment, occasionally it's going to affect you and it probably is going to affect me negatively toward my student	
	569Teaching is not valued because students have not stayed on as employees. Techs are saying "why are we bothering" SEE 303	
	587When she is off, she communicates what the student should be doing and who will be in charge. For the most part everybody's aware of the student. We don't let them drift	
	592For a new clinical instructor, she would give them all her information	
	594For a new CI, see what kind of teaching skills they have or would like to use to see if you can mesh it together with what you have already started.	
	604Wishes she could have observed someone teaching blood bank, not that she would do exactly what they did	
	614When you don't know what anyone else is doing, you are kind of building it on your own	
	621All she had to refer to was her negative experience as a student	
	628All the CI did when she was a student was to read off their notes and tell them what to do	
	630She thinks a CI should personalize the instruction and make it more fun and more exciting	
	637As a clinical instructor you should be yourself	

Appendix J
Horizonalization Statements for Flo
By Research Question or Topic

After horizonalization statements (horizons) were identified for individual transcripts, as demonstrated in Appendix I for participant Flo, potential themes were identified (A, B, C, D, E, O). Prethemes A, B, C (with their subheadings) came from the research subquestions. Categories D, E, O were added as potential preliminary themes.

The primary research question is "How do allied health clinical instructors learn to conduct clinical instruction?" There are three subquestions related to the primary research question,

A"What does a clinical instructor do to learn clinical instruction?"

Aa what do they actually do/don't do

Ab what do they want to do or suggest doing

Ac teaching comes naturally [don't "do" anything]

B"What experiences do clinical instructors call upon to help them in learning to be clinical instructors?"

Bs experience as a student

Bx trial and error

C "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?" Knowles assumptions about adult learners include: (Cooper & Henschke, 2002, p. 5)

1) They are self-directed
2) Their experience is a learning resource (see B)
3) Their learning needs are focused on their social roles
4) Their time perspective is one of immediate application
5) They are intrinsically motivated
6) They want to solve problems
7) They want to know why they need to know something.

D Things have changed

E Should everyone teach?

O obstacle/hindrance to learning to do CI

Related research question(s) or topic/Transcript line & statement/comments

E	18, 487Was told teaching was part of job as assistant supervisor	
E	27Most techs do not teach	
AaC4,6	30-33Thinks about/reflects when she needs to come up with a plan for an individual student	
Aa	31At home thinks about ways to teach some students	
	35Examples of individualization	
Ac	46Learning to read the students is a natural thing, you get a sense	She "reads" students in order to individualize her instruction

B	53Learning to read the students is a natural thing that came on the more I had students	
O	55 Some of them I've found a language barrier	Relevance?
	57-60Let's students determine what they will do, even to their detriment	
AaB	63Thinks about teaching less now than when she started because she's more used to it	Novice/expert?
O	66 3-4 students back to back burnt her out	
Aa	68Doesn't think about teaching cause she does mostly the same things	
BC	69Thinks about it, goes to bag of tricks, if student is different	
Aa	76Thinks about changes she needs to make to content because of new things	
B	79She knows how to teach by how the student is doing	What responsibility does student have for doing well?
Aa	80I did not have a mentor. I didn't really have someone to show me.	
Aa	82,92At first she had some books and materials on subject matter (not teaching) and some study questions	
C5,6	84She revamped the study questions as they were old fashioned	
BC1,5	87She is self-taught	
Aa	96She was given a checklist of what to cover which was developed by previous clinical instructors	
	105FHOSP had a hospital-based MLS program of their own before Flo worked there	
B	116She was not very prepared at all when she began teaching. Her first students were nerve wracking.	
B	117If her students don't flunk, then she has taught them something.	
B	121Thinks her teaching technique has changed a lot now that she is used to what she is going to teach	
B	123She's looser now (more flexible)	
AaC6	130She determines if she needs to improve or change instruction based on how she reads the student. If they are having trouble she changes techniques	But does she seek a NEW technique?
	139If the student is having a lot of trouble, you want to work on them with that and see what they're lacking or what they're not getting	

Aa	153Gets advice or help only with content	No advice on teaching
C6	146Gets help on content from a very knowledgeable coworker	
	165She has changed content to include new information	
	168,180She used a variety of teaching tools, handouts, historical patient data, things that students may not see elsewhere	
C6	183Changed her teaching materials to make it easier for herself and so it works better for the students and because the materials were outdated	
	187Likes that the university gives the students and the hospitals the study questions so she can go over things the students have questions about	
Aa	199Was not required to do anything to be a clinical instructor, it was part of the job as assistant supervisor	
	~~209At the beginning, she was given a packet of material (content related)82,92 duplicate~~	repeat
C6	207At the beginning, she boned up on content	
	220At the beginning, she had no preparation to teach	
Aa	229She does continuing education but nothing related to teaching	
Aa	233She has helped plan the blood bank rotation and feels that this helps her as she is also the one who teaches	
AaBx	237On her own, she has used trial and error to individualize her instruction	
Aa	241She has not taken any courses or read any information on teaching because she hasn't felt a need to	Her survey said she did read
Bs	254As a student her clinical instructors were paid extra to teach and were just teaching to get the money	C said that CI should get incentive
Bs	264,276When she was a student, the clinical instructors were not interested in bothering with students and she did not want to see herself doing the same	
C1	266I can put it on my resume and on my evaluation that I teach, but really I like to teach	
Bs	270Not wanting to bother with students bothers her because these students are people we are going to hire, hopefully	

B	284Her own experiences as an instructor hopefully has made her teaching better	
O	288If she has patient work, the student will be pushed aside. She will try to find something for the student to do but she can't promise	
O	291She wishes that she had a clone in order to cover the bench and teaching	
O	293Even when you are busy the student can learn from just watching, what's going to happen, you need to be organized, you need to pay attention	
O	296To teach better she needs less work and/or more time	
O	301This lack of time/conflict of bench work and teaching is not going to get better	
O	303Some techs are going to ask why they should be bothered with students, 569	
	304We need students because we are going to need them to be techs later on	
B	311She feels that sometimes she is too soft, that students take advantage of her. She takes students' excuses at face value. In the end it affects the student's performance.	Something she has not learned yet
	325Attendance is her biggest problem. She has not had problems with cheating.	
B	334Sometimes students argue for points and she doesn't know if they are looking at the big picture, really learning something, or if they are just out for a grade.	
	337Some instructors will be battered down and give the better grade	
	338Student may not be really learning if they are just spewing information back at you. This can't help them in the end.	Has learned this about student learning
Aa	347She does not really think about becoming a better bench instructor	
B	350If she comes across something that works or a good example, she'll keep that in her bag of tricks.	
Aa	356When she tries to learn to be a better clinical instructor, she goes online to find out more information or more about a blood bank technique.	

Aa	362She finds it hard to assess whether she has improved as an instructor because, although students fill out evaluations for the university, she rarely sees them.	
Aa	365She must be at least staying the same or improving because nobody has come to her and said that her students aren't passing or other issues.	
AaAb	383When she does see the evaluations, she remembers the things that they mention as being helpful.	
O	389When teaching blood bank, you can't duplicate some of the things that would be good for the students to see because it might not come in while the student is in the department.	
	391When she has something that the student should see, she offers to show it to the student even if the student is in a different department.	
Aa	401She does not do self-evaluation	Or doesn't recognize that she does it?
O	405A difficulty that she has had in learning to be a better bench instructor is being patient with everyone while teaching students and getting her work done.	
AcB	417,428Teaching comes more natural now	
Ac	418Being organized, multitasking come naturally to her	
B	421Teaching is like public speaking, at first it's kind of unnerving.	
B	423Now it's a lot easier because she has a spiel	
Ac	429She feels like she is a leader and can give students direction, like to organize them	
AcE	437Teaching comes naturally to some people	
E	438Some people can be really good techs, have the same credentials but aren't very good teachers	
E	439,446Some techs who are really good teachers don't like to teach. They say that they don't think they are good teachers and are not interested.	
Ac	453Going over students' mistakes and correcting them does NOT come naturally. Their reactions are hard to deal with.	

E	466Not everyone should be a clinical instructor because they are not patient enough or willing to work with the students	
E	469Some techs shouldn't teach because they need to focus and having students would be a distraction	
E	473She thinks people can learn to teach but they shouldn't if they don't want to teach. Students will pick up on that.	
E	477Just because you could teach doesn't mean you should	
	499Invite techs to teach but no one has volunteered in the last while	
B	514Job experience is going to make you a better teacher because then you're going to have more knowledge to pass on	
B	516Life experience helps because it depends on how you feel about you and yourself and what's going on as to what you are going to put into your teaching	
O	525In order to do a better job teaching, she'd like an assistant	
O	528Sometimes trying to teach and trying to do your work you are going to short something and you don't want to short the patient.	
	539They have a lot of people getting ready to retire and that affects the atmosphere negatively.	
	541She tries not to pass on negativity to the students but they hear it from other techs	Relevance?
	549Hopefully as long as it's not too negative it's gonna pass along something to them later on when they're out in the real world and working. Hopefully they'll learn from it.	
O	563If you have a negative environment, occasionally it's going to affect you and it probably is going to affect me negatively toward my student	
O	569Teaching is not valued because students have not stayed on as employees. Techs are saying "why are we bothering" SEE 303	
	587When she is off, she communicates what the student should be doing and who will be in charge. For the most part everybody's aware of the student. We don't let them drift	

Ab	592For a new clinical instructor, she would give them all her information	
Ab	594For a new CI, see what kind of teaching skills they have or would like to use to see if you can mesh it together with what you have already started.	
Ab	604Wishes she could have observed someone teaching blood bank, not that she would do exactly what they did	
AbB	614When you don't know what anyone else is doing, you are kind of building it on your own	
Bs	621All she had to refer to was her negative experience as a student	
Bs	628All the CI did when she was a student was to read off their notes and tell them what to do	
B	630She thinks a CI should personalize the instruction and make it more fun and more exciting	
	637As a clinical instructor you should be yourself	

Appendix K
Composite Horizonalization Statements
All Participants (ABCDEF)

After horizonalization statements (horizons) were identified for individual transcripts, they were combined as shown in this appendix into potential themes (A, B, C, D, E, O). Prethemes A, B, C (with their subheadings) came from the research subquestions. Categories D, E, O were added as potential preliminary themes.

The primary research question is "How do allied health clinical instructors learn to conduct clinical instruction?" There are three subquestions related to the primary research question,

A"What does a clinical instructor do to learn clinical instruction?"
Aa what do they actually do/don't do
Ab what do they want to do or suggest doing
Ac teaching comes naturally [don't "do" anything]
B"What experiences do clinical instructors call upon to help them in learning to be clinical instructors?"
Bs experience as a student
Bx trial and error
C "What, if any, adult learning principles do clinical instructors use in learning clinical instruction?" Knowles assumptions about adult learners include: (Cooper & Henschke, 2002, p. 5)

1) They are self-directed
2) Their experience is a learning resource (see B)
3) Their learning needs are focused on their social roles
4) Their time perspective is one of immediate application
5) They are intrinsically motivated
6) They want to solve problems
7) They want to know why they need to know something.

D Things have changed
E Should everyone teach?
O obstacle/hindrance to learning to do CI

PARTICIPANT KEY
White = A, **pink = B & C**, gray = **D** & E, green = F

Related question(s)/Approx Transcript line/ statement/comments

Aa	16First observed a CI and then started teach some of that topic	observation
Aa	32Reflected more on how she teaches at start	reflection
AaBx	37At start used trial and error to help students learn/remember	Trial & error
Aa notB	75She has the same basic sense about whether the students have gotten the basics	Basic sense How?

AaBBs	63At start was not prepared to teach but knew content from school and job experience	
Aa	80Determines whether she needs to improve or change teaching technique through student feedback	Student feedback, direct
Aa	84Changes teaching methods as a result of written student evaluations	Student feedback, written
AaBC	94After she's tried things herself, has sought help from others regarding problems with students such as cheating or poor grades	Sought help from others What others?
Aa	105In handling situations with students, she consults with coordinator about the student's previous performance	Consult with educ coord
Aa	145Does not do any continuing education in teaching but in area she teaches	No CE in teaching
Aa	~~156Uses written student evaluations to improve herself 84~~	
Aa	157Discounts negative evaluations from students who she failed/made to repeat	Does not use negative evals from students who failed
Aa	169Has read a little on how to improve student learning/memory	Reading
Aa	170Has read articles in lab journals about teaching	Reading
Aa	174Although she learned by watching someone, she does not really consider her a mentor	Observing others
Aa	274The education coordinator tells the CI of student complaints	Student complaints via educ coor
AaC	278She denies doing formal or informal self-evaluation regarding her teaching	Does not do self-eval Student feedback, direct
Aa	**23Learns from talking to other CI**	Talking to other CI
Aa	30I am always trying to think of better ways to explain the bench to them	Reflect?
AaB	**63 At first information is fresh from school**	Recall info as student
AaB	**130As a result of the bad training experience, she tried to have close rapport with the [university] faculty, to find out their expectations, their checklists**	Exper as student
Aa	**153Observed other trainers and tried to emulate the ones who were more successful**	Observed other CI
Aa	**233Has not asked for advice about teaching**	Has not asked for advice
Aa	**234Gets feedback from coworkers who overhear his teaching**	Feedback from coworkers
Aa?D?	**281Probably have not changed my technique of training over the years very much at all**	Has not changed technique Then what has he learned?
Aa	**30I think about it a lot**	Thinks about it Reflects(?)

Aa	**315New CI are given a little booklet with all of the checklists**	Checklists
Aa	**317In the past, CI have had an inservice**	In-service on teaching
Aa	**330The training policy [handbook] gives a lot of tips on how to train students and new employees; it includes the checklists, it is a formal policy guide for the trainers to follow, CI must review it every year (mandatory)**	CI handbook mandatory
Aa	**341Continuing education that techs do is not specific to training**	No CE on teaching
Aa	**398Instruments themselves have training software on them, even videos**	Manufacturers training?
Aa	**404A mentor emphasized drawing hematologic cells**	Mentor
AaB	**415Learned from the first person to train him as a tech – learned that students will learn faster and better by doing things themselves**	Other tech Exp as "student"
AaB	**426Learned from first person to train him to be very patient and don't go too fast**	Other tech Exp as "student"
Aa	**486When she first started as a facilitator she went to a teaching preparedness class, TIPS, on how to use overheads, how to give a presentation.**	Class on teaching
Aa*	496Even though the course addressed formal teaching it helped her do bench teaching by now being intimidated by really bright students	?
Aa	**505He feels that a speech class in college helped build confidence in getting in front of a group of people – one on one teaching is nothing after that**	Draws on learning from college speech class
Aa	**544Supervisors evaluate instructors by observing and listening**	Supervisor evaluation
Aa	**547CI are formally evaluated by students and coworkers in writing and verbally.**	Student feedback, written Coworker evals, written, oral
Aa	**560University sends the site the student evaluations of the instruction which are posted (without names)**	Student feedback, written (anonymous)
Aa	**582CI subconsciously evaluate what they're doing, always trying to be better**	Subconscious evaluate self
AaC	**41Don't put a lot of thought or energy into it**	**No perceived problem**
Aa	**45Do not reflect on how they teach**	**Do not reflect**
Aa	**62,66Only get general criteria from university on what to cover**	**Material from university – but mostly what to teach**
AaC	**97At first took time in morning to prepare**	**Spends extra time to**

	how to teach, what to teach, what to say	prepare
AaAb?	**148There is not very much instruction on how to teach**	**Such as courses, orientation? Want more?**
Aa	**198Does not seek help about teaching**	
Aa	**200Asked for help with a student who did not care (did have knowledge and effort)**	**Seeks help From whom?**
Aa	**221There's no orientation or training for teaching**	**No orientation or training**
Aa	**260Hospital is cutting back on sending people for CE**	
Aa	**290-291Do not use other techs as resources for teaching**	**Do no use other techs**
Aa	**305Had 2 role models but not a mentor**	**Do not use "mentors"**
AaC	**407Gets feedback directly from students regarding their comfort and their understanding**	**Student feedback, direct**
Aa	**660Techs do not talk among selves about teaching**	**Do not talk with peers**
Aa	**632Needs candid feedback from the university, student, and boss**	**Do they get it? If not, do they seek it?**
Aa	31At home thinks about ways to teach some students	
AaC4,6	30-33Thinks about/reflects when she needs to come up with a plan for an individual student	
AaB	63Thinks about teaching less now than when she started because she's more used to it	
Aa	68Doesn't think about teaching cause I do mostly the same things	
Aa	76Thinks about changes she needs to make to content because of new things	
Aa	80I did not have a mentor. I didn't really have someone to show me.	
Aa	82,92At first she had some books and materials on subject matter (not teaching) and some study questions	
Aa	96She was given a checklist of what to cover which was developed by previous clinical instructors	
AaC6	130She determines if she needs to improve or change instruction based on how she reads the student. If they are having trouble she changes techniques	But does she seek a NEW technique?
Aa	153Gets advice or help only with content	
Aa	199Was not required to do anything to be a clinical instructor, it was part of the job as assistant supervisor	

Aa	229She does continuing education but nothing related to teaching	
Aa	233She has helped plan the blood bank rotation and feels that this helps her as she is also the one who teaches	
AaBx	237On her own, she has used trial and error to individualize her instruction	
Aa	241She has not taken any courses or read any information on teaching because she hasn't felt a need to	Her survey said she did read
AaC	347She does not really think about becoming a better bench instructor	
Aa	356When she tries to learn to be a better clinical instructor, she goes online to find out more information or more about a blood bank technique.	
AaC	401She does not do self-evaluation	
AaAb	383When she does see the evaluations, she remembers the things that they mention as being helpful.	
Ab	48-52Feels as if she cannot teach because she did not have formal training in teaching	
Ab	57Formal training might have been useful at one time	
Ab	440A course on teaching would not help much.	
Ab	445A course on teaching could help those with some natural talent for teaching but basically they just need to be thrown into teaching, sink or swim.	quote
Ab	452She suggests that CIs do as she did, watch a little and then throw them in, plus having someone available to help/consult.	
Ab	**346Maybe we should include a few questions on training on the annual competency assessment test for those people who are trainers**	
Ab	Need checklists	To teach. To learn?
Ab	**790A new CI needs to have someone review the training policy manual with them.**	
Ab	**792A new CI should observe a good CI teaching the bench that they will be teaching**	
Ab	**806A new CI should be given a written outline and a progression of how they should explain the training process (so there is consistency between teaching techs)**	

Ab	**156A formal course may have helped how to approach & talk to students**	**C but they did not seek it out** **I developed UA guide for Ci as CI**
Ab	**165A formal course may have helped to organize so you can communicate it**	
Ab	**168Shadowing a teaching tech [watching them teach] for a day or two would be good**	
Ab	**353-356Wish they had more feedback from students on how they teach**	
Ab	**626At start needed to job shadow**	
Ab	**627At start needed formal instruction as to how to handle students**	
Ab	**639Needs computer training, i.e. word processing, to do department coordinator stuff**	
Ab	**714A teaching course for new CI could be online, offered by CAP, incorporated into MT programs**	
Ab	**718To learn how to teach, CI could teach seminars and get CEUs for it**	
Aa**Ab**	383When she does see the evaluations, she remembers the things that they mention as being helpful.	
Ab	592For a new clinical instructor, she would give them all her information	
Ab	594For a new CI, see what kind of teaching skills they have or would like to use to see if you can mesh it together with what you have already started.	
Ab	604Wishes she could have observed someone teaching blood bank, not that she would do exactly what they did	
AbB	614When you don't know what anyone else is doing, you are kind of building it on your own	
Ac	297She changes her approach for each student, this comes naturally	individualizes
Ac	320She states that for her it being a CI comes fairly naturally	
Ac	320Some CI's have a hard time talking through what they are doing on the bench	
Ac?	**57If someone enjoys teaching it comes through to the students**	
Ac	**90It takes a certain, natural born, personality or ability to explain things clearly**	

Ac	**92Someone can learn to teach to a certain extent but that does not mean they'll be very good at it**	
Ac	**94Better instructors have an innate ability to explain things better**	
Ac	**637A lot of teaching comes naturally-to natural born teachers who can explain well and put students at ease**	
Ac	**665Having empathy is a personality trait that you are born with**	
Ac	**801They choose trainers using certain criteria such as being observant, caring, detail-oriented, multitaskers, able to articulate what they are doing**	
Ac	**872People know whether they are not good instructors and will ask to not teach**	
Ac	**881Sometimes you are not in the mood to have a student**	
Ac	**939You are born with the personality trait to be organized**	
Ac	**930People who are difficult to follow [disorganized] are consistently difficult to follow**	Techs don't change their work habits
Ac?	**891After working together for years we all know who is good at teaching and who is not**	
Ac	**136Some people have natural talent for teaching**	
Ac	46Learning to read the students is a natural thing, you get a sense	
AcB	417,428Teaching comes more natural now	
Ac	418Being organized, multitasking come naturally to her	
Ac	429She feels like she is a leader and can give students direction, like to organize them	
AcE	437Teaching comes naturally to some people	
Ac	453Going over students' mistakes and correcting them does NOT come naturally. Their reactions are hard to deal with.	

B	39You learn the most on how to teach from the students who have more trouble (who cannot answer questions, who do not pick things up quickly)	
B	26, 64People forget subject knowledge over time	
B	65New things are learned on the job	
*Aa**B**Bs*	63At start was not prepared to teach but knew content from school and job experience	
B	86Changes teaching methods according to individual student	Theme How learned?
B	86Changes teaching methods to find what works for the student to be interested, to learn, and to be involved	
B	91Does not know how she learned to individualize instruction just came to her	Tacit
B	97In younger years was less confident in handling situations with students on her own now	
*Aa**B**C*	94After she's tried things herself, has sought help from others regarding problems with students such as cheating or poor grades	
***B**C*	112As department coordinator, if a tech is not getting along very well with the student, she will sometimes assign the student to a different tech but still involves every tech a little	
B	187Now uses online photos to help teach which allows students to learn more on their own	
B	200CI need to ask or encourage communication because when students are on their own, CI can't see if they understand	
Bs	214Her own experiences as a student only influenced her at the start	
Bs	221Her own experiences as a student motivated her to try not to like an instructor that she did not care for	
B	233With experience, she has learned to read whether the student understands and then tries another technique.	
B	243She has definitely learned from mistakes she's made	
B	252She used to be surprised by what students did but nothing would surprise her now	
BC	329Will say just about anything to students if she thinks they need to hear it	
B	332With experience, it is easier to give negative feedback	
B	330At first she went through the education coordinator to pass on negative feedback to the students	Why?
B	411"Every student probably teaches you something"	
B	367Overall experience helps teaching	

B	424-429Clinical (bench) instruction differs from classroom instruction because of the different environment and atmosphere.	Teaching experience does not translate
B	438Clinical (bench) instruction differs from classroom instruction because it is "learn by doing"	Teaching experience does not translate of the different teaching techniques
B	22Learns mostly from mistakes	
B	23Learns from student input	
B*	48Teaching slows you down because you have to explain everything you are doing and answer questions and things rather than just focus on your job	Answer to 42, 43
B	66You learn the more students you train	
B	67You evolve and become more comfortable	
B	67You learn what to say and what the students respond to	
B	68, 70Every student is different and individual and you need to teach them differently	
B	72After the first couple hours with a student, by asking open ended questions, you find out how to relate to the student	
B	97CI should not go too fast	
B	99Students learn faster and better when the students do everything for themselves rather than observing	[so good CI do this]
B	105When students have to do the work themselves they have to focus and concentrate on what they are doing	
B	115Remembers better experiences and better students she had as a student, how they guided her, counseled her, made her feel included, didn't alienate her, didn't make her feel like a bother	
B	119Remembers bad experience being trained as a new tech and just being handed the package insert, it was pretty much by the seat of your pants	
AaB	130As a result of the bad training experience, she tried to have close rapport with the [university] faculty, to find out their expectations, their checklists	Exper as student
B	136Standardized checklists make it very easy to flow from one student to the next and all work together	
B	141He picked up best ways that he himself learned, from school as a child through job training.	
B	160At first read the procedure and did it step by step as the student watched and then had the student do it [now has the student do it first]	
B	171Checklists help CI remember everything to teach	

B	181"See one, do one" is not the best teaching strategy	Really? Isn't that exactly what we do? How did they learn this?
B	185"See one, do one" is necessary now with reduced staffing	Why? This saves time? What is the better alternative?
B	192When you do not have enough time the student may be put off in a corner to work almost by themselves	Learned this coping technique
B	194It is beneficial to have another tech cover the workload so CI can teach and not worry about the work	Have to learn to cooperate?
B	202Give a pretest on the more subjective material to see what they need to emphasize or not spend as much time on for each student	
B	209CI show students how to cover the workload, how to operate the instrument, and what it is going to be like for the student once they get a job	Learned to teach things besides immediate chore?
B?	218Organizational skills are very important to teach	
B	217Teach troubleshooting if it arises and if you have help	So if not, it isn't taught?
B	225It is easy to get confused if you are not organized	Who, tech or teacher?
B	226If you teach students different ways of doing things, it confuses them	
B	243Teaching is a team effort, if a student needs more time in one area, the other areas need to adapt to teach the rest in the time remaining	Gave example of phlebotomy taking so long that the rest had to be shortened
B	261The team needs to decide what to cover in the time allotted	Learn to adjust to student's needs
B	261Some material may not be covered and the student will need to learn it on the job after they get a job	"
B	268Time spent on certain skills will vary from student to student, some catch on quicker than others	"
B	270CI can cover more material with students who catch on quicker	"
B	279The longer you do CI the better you get at it	
BC	282You learn to train through life in general, you teach your kids	
B	287I have learned to ask more follow up questions, open ended questions, to see if the student understands	How/why did they learn this?
B	298Make the students explain it to you	"
B	303At the beginning you do more talking but in the end you have them talk more and you start quizzing them	"
B	308I learned to change my approach a little bit, 299Don't do all the talking	"

B	310You learn to teach by trial and error	
B	322Training new employees is different	
B	326When sent for training on an analyzer, they are taught how to train it when they get back home	
B	378Now uses images from the Internet to help teach and images from atlases, and DVDs392	
B	382Uses checklists to help teach	
AaB	415Learned from the first person to train him as a tech – learned that students will learn faster and better by doing things themselves	Other tech Exp as "student"
AaB	426Learned from first person to train him to be very patient and don't go too fast	Other tech Exp as "student"
B	431As students they felt like free help, they did the benches	
Bs	440Vowed that she would have empathy for students and be a little more hands on after her bad experiences as a student	
B	455Picked up qualities from instructors that he had	
B	456From bad instructors he learned that the worst thing you can do to a student is to intimidate them or make them afraid of making a mistake.	
B	459So he tries to make them relax, supporting them. The biggest quality of a teacher is to put the student at ease so they feel comfortable.	
B	467As an instructor she's caught herself going too fast and remember that they are just learning it	
Bx	474Over the years he has evolved through trial and error and learning to adjust his teaching depending on how the students respond, how they catch on, if they are where they should be at a certain point	
B	526At first it was evident from student questions that he didn't explain things well.	
B	535At first she was too regimented, following a rigid schedule and discouraging questions	How did she figure out that this was not good?
B	539At first she was not engaging the students in the experience	
B	572CI ask students how they did in previous rotations in order to get clues on how to teach them and relate to them	Individualize instruction
B	612I struggled teaching in the beginning like probably anyone would too	
B	615At first he struggled with how to express himself and clearly explain the process [procedure]	

BC	629He has collected written information to give to the students because you lose the theory over the years if you never use it or teach it	
B	642CI need a general respect for sharing of information and general tolerance for students.	How did they learn this?
B	643CI need to have an attitude that there is no silly question	“
B	644CI need to understand the anxiousness of students	“
B	645CI need to have patience	“
B	647CI need to have high tolerance	“ tolerance for what? Mistakes? Bad behavior?
B	661CI need to have empathy	
B	663You need to be able to switch gears if the student needs it	
B	670Teaching gets better with job experience	
B	670Teaching gets better with life experience	
B	672It takes older students longer to catch on	So they’ve learned to be more patient?
B?	684Older students are not going to give up until they get it and will work hard to get it, they are more mature695	
B	821From experience you know where the students trip up so you pay attention to that	
B	836He has to keep in mind that he is left handed and he may be teaching a right handed student from a left handed perspective	
Bx	861Learning to be a CI is like riding a bike. Somebody describes it to you but you just have to hop on and start peddling and the more you do it by trial and error the better you are. You weave around potholes and just find new ways of making a better experience happen for the students	
Bx	866You learn from your mistakes and your accomplishments	
B	895You have to be organized, neat, and uncluttered on the bench to teach well 214, 920, 933	
B	906You have to be able to organize your time between your student and your work	
B	946The ability to find things in multiple ways, to come up with another way to approach the subject is helpful for instructor955	
B	958You don’t want to give too much information the first day	
B	963You don’t want to teach them everything you know through many years of experience or you will overwhelm them and their eyes start to glaze over	

B	*39Do work a little slower to explain it [the job]*	
B	*42Go with the flow and bring the student with me [do the job]*	
	85Still concentrates on covering everything	
B	104At first just covered what was assigned	
B	*86Teaches how a lab operates*	*Learned to cover more than just her bench?*
B	*86Teaches what they need to survive*	*more than just the bench?*
B	*98Doesn't need this reflection any more*	
B	*106Now adds topics/skills*	*Learned to enrich teaching? Individualize?*
B	*111Learned that students are flexible*	
B	*112Learned that students want to learn more*	
B	*116Doesn't think about different things now e.g. same as at beginning*	*Doesn't realize it?*
Bs	*124Tries to think as a student*	
B	*127Thinks back to own days as a student*	
B	*135You know how to teach by doing it so long (she'd taught 3-4 yr)*	
B	*149There is no help in teaching, no mentoring*	
B	*153At first you just wing it*	*No experience yet*
B	*167At first was not prepared to teach*	
B	*172With experience now acts less as a teacher and more as a coworker*	
B	*174Teaches as if student is a new employee but adds questions*	
B	*180Teaching technique has not changed with experience*	*I do not recognize what I am doing differently but my evals are much better*
B	*184Adjusts teaching or re-explains if student doesn't understand*	*How learned to do this?*
B	*189Adjusts pace to student's understanding*	
B	*192Adjusts pace/teaching if student is not happy*	
B	*211,214Uses hands on teaching technique because she learns best that way*	
B	*218With teaching experience now has students just jump in feet first [doing the lab work]*	
BsC	*300Uses negative experience as student to motivate her to make students feel wanted*	

Bs	*326Experiences as student very much affects how she teaches, to share same good experience*	
Bs	*319Experiences as student very much affects how she teaches, to do it differently*	
B	*335With anything, you improve with time*	
B	*338You gain confidence with experience*	
B	*341You "get that pattern" with experience?*	*What pattern?*
Bx	*344Learning from mistakes is a huge part for anybody learning*	
	385-392Continuity is challenging with many part-time techs/instructors	
B	*385Careful scheduling is necessary so they don't miss something*	*Learn to work with other instructors?*
B	*440Feels more comfortable teaching an area that she knows, has worked in*	
B	*478Learn to teach by being a mom*	
B	*479Learn to teach with age*	*Life experience*
B	*480Learn to teach with experience*	*Job or teaching experience?*
B	*481Learn to teach by being a scout leader and den mother*	
B	*484Learn to teach by being a tutor*	
B	*614 615Teaching gets better with life experience*	
B	*614 615Teaching gets better with job experience*	
B	*617Age brings patience [which helps teaching]*	
B	*617Motherhood brings patience ["]*	
B	*619Confidence with the job helps teaching*	
B	*620Comfort where you work (e.g. comfort with the instrumentation) helps teaching*	
team	661There is little communication between techs about what the student is doing/has done	Should there be?
B	*730-736A CI's experience differs depending on the program*	
B	*731A CI's experience differs depending on different students.*	
B	*738Where the students come from, their background, and what the CI is expected to do changes the CI's teaching.*	
BC	*772The field/job is ever changing and techs never stop learning*	*Never stop learning how to teach better also?*
Aa**B**	63Thinks about teaching less now than when she started because she's more used to it	
B	53Learning to read the students is a natural thing that came on the more I had students	

BC	69Thinks about it, goes to bag of tricks, if student is different	
B	79She knows how to teach by how the student is doing	??
BC1,5	87She is self-taught	
B	116She was not very prepared at all when she began teaching. Her first students were nerve wracking.	
B	117If her students don't flunk, then she has taught them something.	
B	121Thinks her teaching technique has changed a lot now that she is used to what she is going to teach	
B	123She's looser now (more flexible)	
Aa**Bx**	237On her own, she has used trial and error to individualize her instruction	
B	284Her own experiences as an instructor hopefully has made her teaching better	
B	311She feels that sometimes she is too soft, that students take advantage of her. She takes students' excuses at face value. In the end it affects the student's performance.	
B	334Sometimes students argue for points and she doesn't know if they are looking at the big picture, really learning something, or if they are just out for a grade.	
B	350If she comes across something that works or a good example, she'll keep that in her bag of tricks.	
B ASSESS	362She finds it hard to assess whether she has improved as an instructor because, although students fill out evaluations for the university, she rarely sees them.	
B ASSESS	365She must be at least staying the same or improving because nobody has come to her and said that her students aren't passing or other issues.	
Ac**B**	417,428Teaching comes more natural now	
B	421Teaching is like public speaking, at first it's kind of unnerving.	
B	423Now it's a lot easier because she has a spiel	
B	514Job experience is going to make you a better teacher because then you're going to have more knowledge to pass on	
B	516Life experience helps because it depends on how you feel about you and yourself and what's going on as to what you are going to put into your teaching	
Ab**B**	614When you don't know what anyone else is doing, you are kind of building it on your own	
B	630She thinks a CI should personalize the instruction	

	and make it more fun and more exciting	
Bs	621All she had to refer to was her negative experience as a student	
Bs	628All the CI did when she was a student was to read off their notes and tell them what to do	
Bs	254As a student her clinical instructors were paid extra to teach and were just teaching to get the money	C said that CI should get incentive
Bs	264,276When she was a student, the clinical instructors were not interested in bothering with students and she did not want to see herself doing the same	
Bs	270Not wanting to bother with students bothers her because these students are people we are going to hire, hopefully	

C?	14Wanted to help teach and volunteered to teach	
C	58If you care about your teaching, you will better yourself	
C?	69Teaching technique has not changed a lot	Theme "technique" has not change but how they use it has, eg better questioning
AaB**C**	94After she's tried things herself, has sought help from others regarding problems with students such as cheating or poor grades	
B**C**	112As department coordinator, if a tech is not getting along very well with the student, she will sometimes assign the student to a different tech but still involves every tech a little	
Aa**C**	278She denies doing formal or informal self-evaluation regarding her teaching	Does not do self-eval
C	404She feels that she still has more to learn about teaching	Is she doing anything about it actively?
C	22Constantly learning about how to teach	
C	24Constantly striving to come up with different ways to teach (audio, video, questionnaires)	
C	31He takes teaching very seriously	
C	29Students pay good money to train at hospital [pay tuition to their university]	
C	34Thinks about teaching more now because she is the department coordinator; it's her job 21	
C	43CI can get tired of it and burned out	"
C	54Student praise on the evaluations is a reward	
C	62 At first, CI are not comfortable or "fluid" with teaching	

C	148Was not prepared to be a CI at the beginning.	So how did she cope with this?
C	159Was not comfortable at first	
C	321The inservice was not required	
C	396CI need to evolve with the teaching technology	
C	591At first she had anxiety about teaching, about getting it all done in a short period of time	
C	591At first she has anxiety because she did not have any instructional background	
C	619At first she was intimidated by student's questions, afraid that she had forgotten the theory, so she studies on her own	
C	627He learns [theory] from teaching, from looking up answers to students' questions	
BC	629He has collected written information to give to the students because you lose the theory over the years if you never use it or teach it	
C	725Having to work the bench and teach at the same time burns out the training technologists	Answer to 43
C	728An incentive to teach would make it easier to find techs to teach, free tuition, slight pay increase	
C	745Having to work the bench and teach at the same time makes it more likely to make a mistake on the bench and mistakes are made	
C	754Being distracted could lead to a student making a mistake that you wouldn't catch	
C	759It is a joy to teach and to hire students you have taught because you won't have to train them as much	
C	766Bench techs, unlike managers, don't see the value in training new techs to replace the aging workforce	
C	770Aging techs are not as focused as they used to be and eventually will become worse of an instructor 778	Learned about self, mature to admit this
C	775Students are paying good money and this is going to be their career, so they deserve the best possible training	
AaC	41Don't put a lot of thought or energy into it	No perceived problem
C?	72At first worried about covering everything on schedule [bench]	How did they cope with this?
AaC	97At first took time in morning to prepare how to teach, what to teach, what to say	
BsC	300Uses negative experience as student to	

	motivate her to make students feel wanted	
AaC	407Gets feedback directly from students regarding their comfort and their understanding	
BC	772The field/job is ever changing and techs never stop learning	Never stop learning how to teach better also?
C	137If you really want to do it, you will learn to teach	[well?]
C	139Motivated to teach by wanting to help somebody	[do a good job teaching?]
C	140Motivated to teach by wanting to get the students excited about the field/job	
C	142Motivated to teach when realizing that students will be your fellow employees	
C	421As a new department coordinator, she is researching more now [about bench instruction]	
C	497Teaching comes naturally/is not difficult if you enjoy your job and want to share it	
C	497Some people see teaching as a burden	And therefore do a bad job?
C	500Want to treat student well because they might be doing your lab work in the future	Motiv
C	504Want to make sure student is competent because they might be doing your family member's lab work in the future	Motiv
C?	546, 573It would be very difficult to give constructive criticism	Avoidance, didn't learn this
	548Leaves criticism/negative feedback to the liaison/coordinator	
EC	603Poor teachers should not teach because you want students to get a good education	Motiv
C	611Students are paying to be taught	Motiv
C	668Teaching is not a top priority in this lab	
AaC4,6	30-33Thinks about/reflects when she needs to come up with a plan for an individual student	
AaC6	130She determines if she needs to improve or change instruction based on how she reads the student. If they are having trouble she changes techniques	But does she seek a NEW technique?
BC6	69Thinks about it, goes to bag of tricks, if student is different	
C5,6	84She revamped the study questions as they were old fashioned	
BC1,5	87She is self-taught	
C6	146Gets help on content from a very knowledgeable coworker	
C6	183Changed her teaching materials to make it	

	easier for herself and so it works better for the students and because the materials were outdated	
C6	207At the beginning, she boned up on content	
C1	266I can put it on my resume and on my evaluation that I teach, but really I like to teach	
AaC	347She does not really think about becoming a better bench instructor	
AaC	401She does not do self-evaluation	

D	43Now have to think about teaching while working because it is busier on the bench now, there's less time	
D	46It is the extra stuff that has changed	
D	162-3Used to spend half a day with students and now maybe spend half an hour	
D?	263She is not quite as picky but she is still hard	Why not?
D?	304She is probably less patient now than earlier but she does not know how or why she has changed	
D	179Because there are fewer staff, CI need to multitask [teach and work bench]	Theme?: things have changed
TD?	184CI can do an excellent job of teaching if they have time off the bench as happened in the early millennium	Learning?
D	187CI have to adapt their teaching to the economic situation	?
*	189When you have to work the bench and teach at the same time, the student ultimately suffers because you don't have time to explain	?
D	199Things have changed because universities are doing a better job of educating students before they come to the clinical site, so CI don't have to spend as much time on it [theory]	
D	660When she was a student, students were made to be fearful and not expected to show stress because in order to be good techs they need to be able to handle stress	
D	724Scheduling the CI off the bench for the first couple of days is happening less and less because hospitals are hurting	
D	744Older techs (CIs) say, "That's not the way we were taught long ago."	
D?	*740Students come to the CI already having the textbook knowledge; they just need to learn how to be a tech.*	
D	747There's a lot more information now than when older techs went to school	

E	60People who are not made to teach will never be a [good] teacher	
E	63was not prepared to teach but was prepared in knowledge 80[direct] feedback from students is huge Some people just are not made to teach, they do not like it, they do not want to do it	
E	12Techs take turns training students	
E	7Started training because she was on the bench that they happened to need training	
E	79Some people don't have the patience to teach	
E	80Some people are fabulous techs and they know what they are doing but they are not good teachers	
E	81Some techs do not want to take the time to relearn the theory	
E	84Some techs are just not good at teaching or explaining, they cannot clarify what they are trying to teach	
E	89Some techs confuse the students	
E	149Was thrown into teaching	Aa?
E	640Some people are just bad at teaching, they don't want to do it, they don't care about it	
E	33Teach if student is assigned to your bench	
E	224All bench techs teach	
E	240From a couple days to a couple weeks' notice that you will be teaching a student	
E	26Only qualification for teaching is being on day shift	
E	445Some people who know the content cannot teach	
E	450People who teach well do not necessarily need to know the content well	
E	455, 471Explaining what you are doing comes naturally	Ac
E	585Even though not everybody can teach [well], all should teach in order to be fair	
E	587To exempt someone from teaching would be showing favoritism	it is a burden to teach? People don't want to teach?
E	602Teaching is a p art of everyone's job	
EC	603Poor teachers should not teach because you want students to get a good education	Motiv

E	18, 487Was told teaching was part of job as assistant supervisor	
E	27Most techs do not teach	
AcE	437Teaching comes naturally to some people	
E	438Some people can be really good techs, have the same credentials but aren't very good teachers	
E	439,446Some techs who are really good teachers don't like to teach. They say that they don't think they are good teachers and are not interested.	
E	466Not everyone should be a clinical instructor because they are not patient enough or willing to work with the students	
E	469Some techs shouldn't teach because they need to focus and having students would be a distraction	
E	473She thinks people can learn to teach but they shouldn't if they don't want to teach. Students will pick up on that.	
E	477Just because you could teach doesn't mean you should	

O	165It is a very hard balance to find time to spend with the student [and get the work done]	
O	373To do a better job teaching she needs time away from bench work and paper work	
O	378Difficulties teaching include old microscopes, noise, and more work [less time to teach]	
O	410She could learn more from the students if she had more time for discussion with them	
O	41Teaching is not appealing to certain people especially if you are short staffed	Learning?
O	42Teaching can be a burden, a chore	How? Why? Does this affect learning how to teach?
O	47Teaching is more difficult if you are trying to do the bench on top of teaching	Relation to learning?
O	**15Difficult to teach while doing bench work**	**How does this affect learning to teach? No recognized need for CI preparation/expertise**
O	**395Students won't initiate plan for own learning**	
O	55 Some of them I've found a language barrier	
O	66 3-4 students back to back burnt her out	

O	288If she has patient work, the student will be pushed aside. She will try to find something for the student to do but she can't promise	
O	291She wishes that she had a clone in order to cover the bench and teaching	
O	293Even when you are busy the student can learn from just watching, what's going to happen, you need to be organized, you need to pay attention	
O	296To teach better she needs less work and/or more time	
O	301This lack of time/conflict of bench work and teaching is not going to get better	
O	303Some techs are going to ask why they should be bothered with students, 569	
O	389When teaching blood bank, you can't duplicate some of the things that would be good for the students to see because it might not come in while the student is in the department.	
O	405A difficulty that she has had in learning to be a better bench instructor is being patient with everyone while teaching students and getting her work done.	
O	525In order to do a better job teaching, she'd like an assistant	
O	528Sometimes trying to teach and trying to do your work you are going to short something and you don't want to short the patient.	
O	563If you have a negative environment, occasionally it's going to affect you and it probably is going to affect me negatively toward my student	
O	569Teaching is not valued because students have not stayed on as employees. Techs are saying "why are we bothering" SEE 303	

	UNCLASSIFIED STATEMENTS	
	14Wanted to help teach and volunteered to teach	
	22Took total responsibility for the department all at once	
	42Thinks about same things now as at start	
	64School teaches subject knowledge	
	69Teaching technique has not changed a lot	theme
	74Some students go further than others	How does this affect teaching? Learning to teach?
	145Does continuing education related to the content that she is teaching	
	150Directors, managers review student evaluations of the CIs	
	271Directors, managers are probably more aware of how much a person teaches than how well they teach	
	161As department coordinator, she uses student evaluations of other CIs to prompt them to spend more time with students	
	174By watching her predecessor she learned to talk with students instead of at them.	
	239She does not move on until the student gets it	
	244She has regretted giving up on an irritating student	
	255She has second thoughts about dismissing a student for cheating	
	~~263She used to be more picky~~	
	280When pressed she says that she does ask students directly if they need anything else	
	290She will give students extra stuff on a case by case basis	individualize
	350Being a supervisor (she used to be one) is quite different from being a CI. CI work with students whereas supervisors need to be firm and exert authority over people	Theme – educ supr thinks diff
	349Being a supervisor did not help her teach (although she taught before she was a supervisor)	
	363They tend to give good affective evaluations	
	404She feels that she still has more to learn about teaching	
	416It feels good when a student says that you opened the door for them	
	30I am always trying to think of better ways to explain the bench to them	

	40In order to get more trainers, she has to think of how to recruit, how to make teaching exciting, appealing	
	48Teaching slows you down because you have to explain everything you are doing and answer questions and things rather than just focus on your job	Answer to 42, 43
	60[Good] teachers make it interesting	
	60[Good] teachers correlate results with diseases	
	Need checklists	To teach. To learn?
?	184CI can do an excellent job of teaching if they have time off the bench as happened in the early millennium	Learning?
	187CI have to adapt their teaching to the economic situation	?
	189When you have to work the bench and teach at the same time, the student ultimately suffers because you don't have time to explain	?
	385A double head teaching microscope is nice to have to teach hematology	
	356If clinical instructors took the student exams they would fail them big time	Implications? Should they know more? Do students really to know it if techs don't need to know it?
	496Even though the course addressed formal teaching it helped her do bench teaching by now being intimidated by really bright students	?
	612I struggled teaching in the beginning like probably anyone would too	
	649You can't live for the moment	What??
	660When she was a student, students were made to be fearful and not expected to show stress because in order to be good techs they need to be able to handle stress	
	684Older students are not going to give up until they get it and will work hard to get it, they are more mature695	
	686Younger students leave as soon as they can, they've got their lives to live you know	
	704The college years are a big growth stage in maturity, their priorities switch (for some of them)	
	712Need more staffing to try to schedule the CI off the bench for the first couple of days 194	
	68Do not teach textbook stuff, that's taught at university	Not that helpful

	72At first worried about covering everything on schedule [bench]	How did they cope with this?
	85Still concentrates on covering everything	
	104At first just covered what was assigned	
	395Students can't initiate plan for own learning because they don't know what they should be learning	
	446Teaching is an art in itself	Different from tech wk
	464CI don't teach theory because there's too much	
	529, 530Doesn't assess/judge student except for filling out general form at end of rotation	Why not? Don't understand that they are assessing as they go, don't care, don't know how
	546, 573It would be very difficult to give constructive criticism	Avoidance, didn't learn this
	548Leaves criticism/negative feedback to the liaison/coordinator	
	559The education coordinator has a big role with the students, orientation, scheduling, liaison with university, problem solving, giving criticism to students	
	636Needs more time off the bench to do department coordinator stuff	
	661There is little communication between techs about what the student is doing/has done	Should there be?
	691Having students from 2 different university programs is not a problem as they rotate through different departments	
	740Students come to the CI already having the textbook knowledge; they just need to learn how to be a tech.	
	742Would be nice if they could incorporate more theory	
	754It would be nice to have students do a rotation on an off shift because most students will not going to be working day shift when they graduate	
	761It would be hard to have students rotate on an off shift, most hospitals don't	
	768You learn to really be a tech during the first year on the job	
	774Students do not make the decisions on the job that techs do	
	779It would be nice for students to experience that decision-making but they cannot be on their own	
	35Examples of individualization	

	57-60Let's students determine what they will do, even to their detriment	
	105FHOSP had a hospital-based MLS program of their own before Flo worked there	
	139If the student is having a lot of trouble, you want to work on them with that and see what they're lacking or what they're not getting	
	165She has changed content to include new information	
	168,180She used a variety of teaching tools, handouts, historical patient data, things that students may not see elsewhere	
	187Likes that the university gives the students and the hospitals the study questions so she can go over things the students have questions about	
	~~209At the beginning, she was given a packet of material (content related)82,92~~	duplicate
	220At the beginning, she had no preparation to teach	
	304We need students because we are going to need them to be techs later on	
	325Attendance is her biggest problem. She has not had problems with cheating.	
	337Some instructors will be battered down and give the better grade	
	338Student may not be really learning if they are just spewing information back at you. This can't help them in the end.	
	391When she has something that the student should see, she offers to show it to the student even if the student is in a different department.	
	499Invite techs to teach but no one has volunteered in the last while	
	539They have a lot of people getting ready to retire and that affects the atmosphere negatively.	
	541She tries not to pass on negativity to the students but they hear it from other techs	
	549Hopefully as long as it's not too negative it's gonna pass along something to them later on when they're out in the real world and working. Hopefully they'll learn from it.	
	587When she is off, she communicates what the student should be doing and who will be in charge. For the most part everybody's aware of the student. We don't let them drift	
	637As a clinical instructor you should be yourself	

Appendix L

Meaning Units Combined

Horizonalization Statements were analyzed and grouped into Meaning Units, which could be considered pre-themes. The letters at the end of each line refer to the participant (A, B, C, D, E, F) and the number refer to the transcript line number of the participant (so the researcher could refer back to it and perhaps use verbatim examples in the dissertation).

<u>Aa CI use the following to learn to do CI</u>

Experience – see Meaning Unit B
- Trial & error (see B)
- Experience as a student (see B) A63, B63(info)
- Experience being taught in the job setting B130, C415, C426
- Job experience (see below category B)

Observation of other instructors A16, A174
Reflection/thinking about it A32, C301, C582, E97, E98(not any more), F30, F31, F63(less now)
Direct student feedback, verbal or nonverbal A80, B72, D407,F130
Written student feedback A84, A157 (not neg), A280, A416, C547, B560, F383, F362(doesn't see)
Sought help from other, unspecified G200, education coordinator A274, other CI B23, B153, coworkers A94, A105, C234, C547, F153
Reading A169, A170
Checklists B136, C171, B130, B315, E, F96
In-service on teaching B317
CI handbook B330
Formal course or training in teaching B486, B496, D
Experience from college speech class C505
Supervisor evaluation C544, F365 (not)
Material from the university D62, D66
Going to manufacturer training C326, C398
Mentor B404
Content materials from predecessor F82, F92

Things they Do NOT use

CE in teaching A145, B341, E260, F229
Self-evaluation A278, F401
Asking for advice C233, E198
Reflection D41, E45, F68, F347
Formal course/instruction/orientation on teaching D148, E221, A440, F24
Mentoring D149, D305, F80
Just wing it D153
Other techs D290, D291, D660

Does not use anything

Has not changed teaching technique A69, C281
Don't put a lot of thought or energy into it D41

Ac Comes naturally or not

More to learn (all is not natural) A404
Individualizing instruction comes naturally A297, A320, F46
Explaining, some have hard time, some have innate ability to explain clearly A320, C90, B94, C637
Enjoyment of teaching B57
Some people can learn to teach to a certain extent but that doesn't mean they'll be good at it B92
Putting students at ease comes naturally for some C637
Having empathy C665
Being organized C939, F418
Some people have a natural talent for teaching E136
Respect for teaching B642
Tolerance for students B642, C647
Attitude that there's no silly question B643
Empathize with student, eg anxiety B644, B661
Have patience B645
Ability to switch gears B663
Comes more naturally with experience F417, F428
Multitasking F418
Being a leader F429
Correcting student mistake – NOT B, F453

Ab What CI would like to have used

Formal course or training in education A48-52, A57, A445, D156, D165, D627, D714
Observation/job shadow A452, B792, D168, D626, F604
Having someone available to consult with A452
Have teaching be part of the annual competency assessment B346
Have someone review the training manual with them B790
More feedback from students, university, supr D632, E353-6, F383
Written outline/sequence of what they will teach C806
See what skills they have or want to use F594

B What experiences do CI use to learn to be CI?

Experience as a student or trainee
    As student C141, B431, C455, D127, D326
        Content A63, B63
        Only influenced her at the beginning A214
    As employee B119, C141, C415, C426
    What not to do A221, B115, B130, B440, C456, E300, E319, F621, F628, F254, F264, F276
Job experience A26, A63, A64, C670, B440, D614, D615, D619, D620, F514
Experience with students who have more trouble A39, F130, F139
Experiences that help them learn to:
    individualize instruction A297, C68, C70, C268, C270, C474, F30, F35 (examples)
        read whether student understands and use another technique A233, F63
        relate to the student B72
        give pretest/ask questions to see what the student needs B202, C572
        ability to switch gears/re-explain if student needs it B663, E184
        adjust pace to student D189, D192
        come with multiple ways to approach the subject B946, B955
        cover more material with quicker students C270, D106
        depending what school they come from E738
        go to bag of tricks F69
    gain confidence A97, C67, D338
    when she needs help A94
    use new resources (Internet photos) A287
    ask questions, communicate with students A200
    what to say, what students respond to C67, F423
    not go too fast C97, C426, B467, D39
    not too much the first day C958

don't teach them everything you know C963
have student do it for themselves rather than observing C99, B160, C415, D211, D214, D218
"see one do one" is not best strategy B181
Work as a team in teaching the student C194, B243, B261, E385, D661(not), F587
Teach more than how to operate the instrument (how to handle workload, what job is like, organizational skills) C209, C218, D86
Be organized B225, B906
Have a neat and uncluttered bench B895
Don't teach students different ways of doing things C226
Ask follow up questions, make them explain it back to you B287, B298, C303, B308
Don't intimidate or make them afraid of making a mistake C456
Make students at ease and feel comfortable C459
Explain better C526, C615
Be less regimented B535, F123
Encourage questions B535
Create written theoretical information so you don't forget it C629, F
Know where students usually trip up C821
Keep in mind that some people are left-handed C836
Experience giving negative feedback A332 (could just be maturity or experience as parent)
Act as coworker rather than teacher D172
Teaching slows you down C48
Older students work hard, more mature B684, B695
Change teaching technique F121
Deal with students taking advantage of her F311, F334
Make it funner and more exciting for students F630
Be yourself F637

Experiences that help them learn THAT:
Students are flexible D111
Students want to learn more D112

Experience teaching A411, C66, C279, E135, E335, F417, F428, F284
Experience teaching in other venues E484
Experience teaching new employees D174
Life experience, parenting, age A367, C282, C670, D478-481, D614, D615, D 617, F516
Learning from mistakes B22, C866, D344
Trial and error A37, C310, C474, B861, F237, F350
Experience using checklists B136, C171, C382 (learn order, content to teach)
Struggles at the beginning C612, C615, D104, F116, F421, F220
Experience differentiating real learning from just spewing back F338

What experiences CI do NOT use to learn to be CI?

Experience teaching in the classroom A 424, 438
Experience training new techs C322

What experiences are NOT used for:

What they think about E116
To change teaching technique E180
Teaching students from another program is different D730-736

Cope with less time/changes

Have students go work by themselves C192, F288
Only teach troubleshooting if it arises, if you have help B217
Some material may not be covered and the student will need to learn it on the job after they get a job B261
New economic situation B187
Organize your time B906
Field is ever changing D772
Have to think about teaching while working [as opposed to planning ahead?] A
Less time/fewer staff A43, A 162, B179, B184, B199, B712, C48, C189, C724, F291, F296, F301, F528
Less picky now A263
Less patient now A304, F405
Universities doing better job of teaching B199
Teaching has changed E744, B187, B660
There's more info/new info now E747, F76
Burn out F66
Watch F293
Negativity F563

Can/should everybody teach?

ACTUAL PRACTICE:

A All teach but most time is spent with better ones
B&C CI are selected using unpublished criteria
D&E All teach, rotate
F Mostly assistant supervisors teach

People who are not made to teach will never be a [good teacher] A60
People just are not made to teach, they do not like it, they do not want to do it A80
All techs take turns training students C12, E224, E602, F27 NOT
Techs get students if they are on the bench that the students are assigned to B78, D33
Some people don't have the patience to teach B79, F466
People who are fabulous techs may not be good teachers B80, E445, F438
Some techs do not want to take the time to relearn the theory B81
Some techs are just not good at explaining, some techs confuse students C84, C89
Some techs are just bad at teaching, they don't want to do it, they don't care about it B640
People who teach well do not necessarily need to know the content well E450
Even though not everybody can teach [well], all should teach in order to be fair E585, E587
Poor teachers should not teach because you want students to get a good education D603
Some good teachers don't want to teach F439, F336
Some techs would be distracted by having students F469, B&C
Students pick up on techs who don't want to teach F473

Adult learning principles used

1. Self-directed
   Some CI actively strive to learn to teach or teach better but some do not. A14, A58, A404, B22, B24, C30, C31, B54, B321, B619, F87
2. Experience is a learning resource
   This is a major theme
3. Learning needs are focused on their social roles
   Not applicable?
4. Time perspective is one of immediate use
   Seek feedback and advice to apply to a specific situation or ongoing improvement A94, C34, C43, C396, B619, C627, B766, E407, E421, F30, F130

5. Are intrinsically motivated
   What CI learn is a result of applying experience or other techniques to their own teaching. There are no outside forces or requirements. A58, C29, B619, B725, C774, D72, E137, D139, D140, D142, E497, D603, D611, F84, F266, F391
6. Want to solve problems
   As with #4, situations or problems can motivate CI to act as adult learners, especially as they begin to teach. They have also had to learn to deal with less time to teach. A94, A112, B62, B148, B159, B591, B619, C30, C627, B725, C754, B759, E41, E97, D500, E504, D668, D772, F69, F146, F207, future techs F270, F304
7. Want to know why they need to know
   Not applicable?

   The CI do NOT seem to function as adult learners in some respects: they do not think about teaching much, do not reflect much on teaching, do not do self-evaluation, sometimes leave difficult tasks to others or don't do them at all (avoid giving criticism, do not teach troubleshooting if they don't have an extra tech). A 69, A278, C233, B728, D41, E45, E198, D 546, D573, D548, D661, F347, F401.