USE OF REFLECTION IN MEDICAL EDUCATION

A Dissertation Presented to

the Faculty of the Graduate School

at the University of Missouri-Columbia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

By

MELISSA D. GRIGGS

Dr. Joe F. Donaldson, Dissertation Supervisor

April 2009

The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

THE USE OF REFLECTION IN MEDICAL EDUCATION

presented by Melissa D. Griggs,

a candidate for the degree of doctor of philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

Professor Joe F. Donaldson

Professor Margaret Grogan

Professor Jeni Hart

Professor Peggy Placier

Professor Joan Hermsen

This dissertation is dedicated to Tara. We supported each other through two of these! With radical trust, we have great things ahead of us.

ACKNOWLEDGEMENTS

Thank you to everyone who helped me to complete this project. To my advisor Joe F. Donaldson who has continually impressed and by his example inspired me since I took his Adult Learners class more than a decade ago. I have learned so much from him about being a scholar. Despite being extremely busy, he never made me feel rushed or like a burden. That's a gift! I also want to thank my committee members Drs. Margaret Grogan, Jeni Hart, Joan Hermsen, and Peggy Placier. Since my first class in this PhD program I have been learning from these awesome women. I am a better thinker and scholar because you have challenged me-- thank you. So many others have made this project possible. I am so grateful to those that provided needed data, took time to participate in interviews, and served as secondary coders. I hope I can reciprocate some day.

I also appreciate Dr. Kimberly Hoffman for all of the mentoring and support that I have received in the last three years. I have had some really great experiences because she was gracious enough to include me. Thank you. Also thanks to my "Clinical Scholars" group who cheered me on.

Thanks to my family who always emphasized the importance of education and cut me slack when I cut visits short to get back to work! Thanks to my dissertation support group and all of the pep talks along the way. Thanks to my partner who after many discussions and reading a million versions of this dissertation now knows more than she ever wanted about reflection!

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Figure Page

LIST OF TABLES

ABSTRACT

Physicians deal with complex and ill-structured problems and must reflect in order to function professionally while adapting to their patients' needs. This qualitative single case study explores the meaning and use of reflection in the professional preparation of physicians within the medical school of a Midwestern University. Along with a review of the types of reflection assessed (Aukes et al., 2007) and an analysis of Epstein's (1999) Levels of Mindfulness in guided student reflections, faculty and administrators were interviewed to learn more about their perspectives related to reflection.

Assessing reflection in medical education is complicated by a lack of agreement about definitions and goals. Although scientific reflection and clinical reflection are more heavily assessed in written evaluations, faculty tended to discuss personal reflection (learning from experience) more during interviews. Most interviewees focused on one aspect of the phases of reflection (trigger, critical analysis, or outcome) rather than the entire process. Some were particularly uncomfortable with the idea of assessing an internal process. The use of Epstein's (1999) Level of Mindfulness was useful in assessing quality and focus of students' written narratives, however the levels do not work well as a continuum for this purpose and proved to be too broad to detect more subtle shifts in thinking across time. In addition, encouraging students to tell stories seems to stimulate deeper reflection. Using common definitions can help facilitate meaningful opportunities for reflection into the curriculum.

CHAPTER ONE

INTRODUCTION

Educators often identify reflection as an important teaching goal. But reflection has different meanings depending on context and vantage point. In general, reflection is a cyclic process of self-regulation (Driessen, 2005; Korthagen, 2001) — a way for individuals to assess their own thinking and behavior in order to make adjustments. An association between reflection and critical thinking has remained strong since first introduced by Dewey in 1933. Particularly in medicine and healthcare, the term often refers to critical thinking or problem solving. In addition, Schön's work (1983, 1987) suggesting a strong association between reflection and practice influences much of the recent work on reflection.

In general, the medical profession values the ability to reflect and sees it as necessary to practice as evidenced by the inclusion of reflection as a component of the Accreditation Council for Graduate Medical Education Core Competencies of Practice-based Learning and Improvement (ACGME, 2008). Physicians deal with complex and ill-structured problems. They must be able to reflect in order to function professionally while adapting to their patients' needs. While practitioners and medical educators express enthusiasm about the use of reflection, the literature on the topic has been limited. Many medical schools incorporate "reflection" into the curriculum and student assessments. But with so many definitions and interpretations, a question remains about what is really being assessed.

This study explores the meaning and use of reflection in the professional preparation of physicians. This qualitative single case study examines the use of reflection within the medical school of a Midwestern University designated a Research University (Very High Research Activity) by the Carnegie Foundation. Along with a review of existing evaluations and an analysis of guided student reflections, I interviewed faculty tutors and medical education deans to learn more about their perspectives. The goal was to produce a thick description of the use of reflection at this medical school. Specifically I investigate how faculty define reflection in the first 2 years of this medical school's curriculum, and how students' written reflections relate to ratings of reflective ability given by faculty.

Research Questions

This study aims to answer the following question: How is the concept of reflection used in the educational preparation of physicians? The following sub-questions help to answer the larger question:

1. How is reflection defined and evaluated in the first 2 years of the medical school curriculum?
    a. What are faculty and administrators' beliefs and values related to reflection?
    b. What types of reflection are assessed: scientific, clinical, personal (Aukes et al., 2007)? Why were these items chosen?
2. What is the relationship between faculty's perceptions of a student's reflective ability (as demonstrated in scores received on tutor evaluations)

and the level of mindfulness (Epstein, 1999) demonstrated in the student's assigned reflections?

Background

In medical practice and education, the term "reflection" is often used interchangeably with critical thinking, problem solving and decision making related to scientific and clinical knowledge. Coleman, Rogers, and King (2002) define critical thinking in terms of open-mindedness and ability to seek answers to ambiguous problems. Medical educators and practitioners value this type of reflection. Many consider it integral both to a physician's competence and professionalism: "Skills, knowledge, and experience are necessary for professionalism, but sophisticated reflection on the doctor's part is also required to produce insights enabling the individual to better address the needs of patients specifically, and society generally" (Hilton & Slotnick, 2005, p. 59). If they are to meet the needs of patients and provide the larger social benefit of their practice, physicians must do more that simply follow a formula for treating specific symptoms or diseases.

Clinical judgment is complex and involves taking scientific knowledge and making interpretations in light of not only the individual patient but also the patient's needs and preferences (Mamede & Schmidt, 2007). Critical thinking is often emphasized as the major activity of clinical judgment. However, Tanner (2006) proposes a model in which background experience, knowledge of the patient and context/culture contribute to the reasoning patterns used to make clinical judgments. Although no empirical evidence is available, some scholars

propose a connection between reflection and diagnostic errors. Mamede and Schmidt (2007) theorize that physicians showing flexibility in thinking and use of reflection are less likely to commit diagnostic errors. They also outline how each of Epstein's (1999) levels of mindfulness can be applied to avoid diagnostic errors.

Due to ever changing scientific and clinical information, physicians must constantly identify and take the initiative to meet his or her own learning needs. In order to do this, practicing physicians must be able to consider their own strengths and weaknesses as well as behavior, knowledge and decisions. Medicine has recognized the value of self directed learning. The Association of American Medical Colleges considers lifelong learning a key objective for medical education (AAMC, 1998). Reflection-in-learning (thinking about what one learns and how) helps students to take control of their learning (Boud, 1985; Sobral, 2000). In addition, Mitchell (1994) found that learners who reflect are more satisfied and find more meaning in learning experiences.

In contrast to the critical thinking and problem solving aspects of reflection, others such as Aukes et al. (2007) consider the necessity of reflecting on experiences in order to make meaning. This is a more "personal" reflection that many medical professionals associate with feelings and opinions and consider too subjective to address as part of the formal curriculum. According to Coulehan (2005), personal reflection is not considered an important skill for physicians. Some scholars have begun to argue the importance of this type of reflection in building relationships with patients (Dobie, 2007). Physicians must know their

own biases, feelings, and thoughts in order to provide the best patient centered care. Reflection requires taking on another's view (Boenink et al., 2004). In order to be patient centered, the physician must be able to do this. Rather than being a set of prescribed behaviors, patient centered care is more a philosophy—a way of being. According to Epstein (1999), doctors gain the ability to observe patients while observing the self.

Much of the literature on reflection addresses educational approaches to its promotion. Writing assignments and portfolios are meant to encourage students to think about relevant experiences. Portfolios may be formative or summative and most often contain relevant samples of student work. Having and telling stories turns knowledge into understanding (Astrom, Norber, Hallberg, & Jansson, 1993; Benner, Tanner, & Chelsea, 1996). So the act of reflecting and telling stories helps students to translate what they are learning into understanding they can use with their patients.

The Educational Context

In the United States, medical school programs take 4 years to complete with most schools focusing on basic sciences in the first 2 years and clinical skills in the last 2 years. In the third year, students participate in required core clerkships, which include family medicine, internal medicine, obstetrics-gynecology, psychiatry, surgery, neurology, and child health. During clerkships, students work in clinics and hospitals, participating as appropriate. Students focus on interests and specialties in the fourth year. Medical educators who value self-directed and experiential learning may try to incorporate opportunities for

reflection into the curriculum. Problem based learning (PBL) promotes critical thinking and problem solving (Gillian & Strivens, 2000; Williams, 2001) and requires a large degree of self direction from students (Norman & Schmidt, 1992). Because medical practice requires these competencies, many medical schools use problem based learning to some extent.

The institution being studied has followed a PBL curriculum for more than ten years and admits a cohort of about 100 students per year. In the first 2 years, each year is divided into eight blocks of ten weeks. Students are divided into groups of eight that change each block. There are no discipline specific courses. Instead learning focuses on patient cases and patient care knowledge and skills. Students usually have two tutors per block- one for PBL and one for the patient care course. Students have some opportunity for patient care experiences in the first 2 years, but the main clinical focus is in the last 2 years. Several years ago, the school developed a list of characteristics that students should possess upon graduation: (a) Able to deliver effective patient centered care (PCC), (b) Critical thinking and Problem-solving, (c) Committed to life-long learning and information mastery, (d) Committed to improving quality and safety, (e) Knowledgeable in biomedical sciences, evidence-based practice, and societal and cultural issues, (f) Honest with high ethical standards, (g) Able to collaborate with patients and other members of health care team, and (h) Able to communicate with patients and others. See Appendix A for a detailed description of each characteristic. The list shares many similarities with the general competencies identified by Accreditation Counsel for Graduate Medical Education (ACGME) in 1999. As part

of their portfolio, students complete guided reflection exercises after the first and second years and in the middle of the third year. These questions focus on personal strengths and weaknesses and future goals related to the graduation characteristics. In addition, second year students provide artifacts of their competency in each of the eight characteristics. Throughout the first 2 years, tutors provide numerical ratings as well as comments to students for various areas of performance including self-reflection, problem solving ability, and group interactions. These evaluations provide an artifact of faculty thinking related to reflection by means of what was included and excluded from the evaluation.

Unfortunately, students of any program sometimes receive contrary messages. They may read about the importance of patient centered care in program materials but receive other messages in the day-to-day activities of professional preparation. This informal or hidden curriculum does not always support students building communication and relationship skills (Dobie, 2007). And with so many different definitions of reflection, it may not be abundantly clear which, whose, and how these definitions are being incorporated into the curriculum and lived by the students and faculty. This dissertation explicitly analyzes the espoused and lived values of the faculty, administrators, and students at one particular medical school to help understand how those involved (students, faculty, and administrators) have interpreted and used reflection to train medical students.

Conceptual Context

This section outlines conceptual frameworks supporting this research including types and levels of reflection. In addition, I provide definitions used and assumptions made related to this research.

Types of Reflection

Aukes et al. (2007) outline three types of reflection in medicine: clinical, scientific, and personal. Scientific reflection and clinical judgment are most emphasized and may be called problem solving, decision-making, or critical thinking. The authors describe personal reflection as reflection-ON-experience—emphasizing sense-making in medical practice. Personal reflection tends to be seen as a personality trait or private attitude outside of the medical tool kit (Coulehan, 2005). In this study, the items faculty developed to assess reflection were coded according to which of the three types of reflection they assess.

Level of Reflection

Epstein (1999) does not limit reflection to scientific reasoning, clinical decisions, or personal experiences. Instead he speaks of the mindful practitioner as one who "attends, in a nonjudgmental way, to his or her own physical and mental processes during ordinary everyday tasks to act with clarity and insight," (p. 2) and suggests that mindfulness is integral to competence. Epstein expands the idea of reflective practice and highlights the interdependence of action, cognition, memory and emotion proposing the following Levels of Mindfulness:

0) Denial & Externalization— the problem as "out there", person may avoid responsibility or reflection.

1) Imitation/Behavioral Modeling—takes some responsibility, but uses external behavioral standard to resolve situation.
2) Curiosity/Cognitive Understanding—makes decisions based on cognitive models. Reflects to generate hypotheses but ignores personal knowledge, tacit knowledge, and emotions.
3) Curiosity/Emotions and Attitudes—shows curiosity about feelings, thoughts, and behaviors without labeling them as good or bad.
4) Insight—shows understanding about the nature of a problem, how to attempt to solve the problem, and the interconnectedness of practitioner and knowledge.
5) Generalization/Incorporation and Presence—uses insight to generalize. Incorporates new behaviors and attitudes and shows compassion.

Mindfulness can be applied to any aspect of medical practice. As can be seen from the levels, mindfulness is more than critical thinking related to symptoms and diagnoses or personal reflection on feelings. Rather it is a global approach to medical practice. For this study, I use Epstein's (1999) levels of mindfulness to analyze student narratives related to performance and progress in the first 2 years of medical school.

Definitions

Blocks- The units by which the studied medical school divides academic years. Each year consists of four ten week blocks—Eight weeks of instruction, one week of evaluation, one week off.

Clerkship- A course occurring in the third and fourth years of medical training usually focused on a specialty area and lasting 2 to 8 weeks.

PBL- Problem Based Learning is an educational approach in which students learn by attempting to solve a problem. In the curriculum being studied, small groups are presented a new case every week and must diagnose the patient and develop an appropriate treatment approach.

Tutor- Educator that facilitates the problem based learning group process without lecturing or providing the group answers.

Mindfulness- Nonjudgmental attention to physical and mental processes of everyday tasks in order to gain insight and inform actions (Epstein, 1999).

Clinical Reasoning (doctor as expert)- Problem- and patient-oriented understanding, judgment and decision making. The key function of clinical reasoning is to solve a problem. This is reflection related to solving a patient's problem.

Scientific Reflection (doctor as scholar)- Critical appraisal of literature and one's own practice, ground in evidence and clinical epidemiology (Sackett, Haynes, Guyatt, & Tugwell, 1991). The key function of scientific reflection is optimizing scientifically-based clinical decisions or evidence-based medicine. This is a more technical view of reflection.

Personal Reflection (doctor as person)- Consideration of experience (own and others) in order to make sense/meaning. Aukes et al. (2007) calls this Reflection-on-Experience. Attends to the process of sense making about practice, thoughts, emotions, and beliefs.

Assumptions

In this section I make explicit assumptions I have made related to this research. First, multiple constructed realities exist (Denzin & Lincoln, 2000). Using a qualitative approach (specifically a case study) allows a multifaceted view of reflection in medical education to emerge that would be difficult to achieve with a national survey of medical schools. Second, knower and known shape each other (Denzin & Lincoln, 2000). I tried to remain aware of my position in relation to this research at all times. Chapter three outlines the ways in which I formally monitored my influence on this research.

Third, although reflection is an internal process, I have assumed that cognitive processes and behavior are connected therefore evidence of reflection can be observed. Fourth, I assumed that programs assess/evaluate what they value. Therefore, written evaluations used by this medical school provide an artifact of the faculty's beliefs and values.

Lastly, I have assumed that reflection applies to intrapersonal and interpersonal aspects of medical practice as well as clinical and scientific aspects and that being a more reflective practitioner ultimately benefits patients.

Research Design and Methodology

This study uses a case study design and is qualitatively oriented. A qualitative approach was chosen because the information sought can best be gained through rich descriptions of experiences and negotiated meanings. The end result is not the focus but rather the process by which faculty and students

make meaning of reflection and its place in professional practice. Although there are some quantitative elements, these numbers are used to aid in description and understanding rather than to attempt prediction. Case studies are the preferred method (a) when research questions are “how” or “why”, (b) when studying naturally occurring events over which the researcher has little control, and (c) when studying contemporary events that can be directly observed or better understood through interviews and other documentation (Yin, 2003). This study matches these guidelines as it focuses on how reflection is perceived and used in the education of medical students, the effort being researched was not experimentally arranged in any way, and the effort is current and ongoing.

Data collection and analysis included a review of evaluations used to assess reflection, interviews with faculty and education deans to assess beliefs and perspectives on reflection, and qualitative analysis of existing student products related to reflection. Direct interpretation of the interviews was recorded in a reflective journal that documented personal reactions, content, and methodological questions as they arose. Although the aim of this study is not to produce grounded theory (Glaser & Strauss, 1967), I used the technique of constant comparison to identify emerging themes in interviews. I emphasize interpretive understanding of participants’ meaning rather than looking for universal truth.

Limitations

I identify four main limitations of this study. These include my skill and knowledge limitations as a researcher, my position in relation to this case,

difficulty on the part of tutor and administrators' remembering events occurring in the past, and limited participation. Because the researcher is the primary instrument for data collection and analysis in case studies, these activities are limited by my knowledge, past experiences, skills, and potential biases (Merriam, 2001). My employment position allows me greater access to participants and data than I might otherwise have, but I must consciously deal with overlapping relationships and any concerns that participants might have regarding my role. Although it did not appear to be the case, participants may have been hesitant to discuss any negative aspects of their experiences related to the use of reflection in the curriculum. Also, because most of the participants are busy educators and clinical faculty, there was limited opportunity for follow up interviews. Lastly, because the tutor evaluation was developed several years ago, two of the main developers are no longer with the university and those remaining had a difficult time remembering the development process.

One aspect of this research may be considered both an asset and a limitation. The evaluation data used in this study pre-dates this research. Therefore there was no opportunity to validate the items or do cross-rater reliabilities. This was important to the overall goal that involved exploring the use of reflection as it naturally developed; however this means that assessment items and student ratings reflect individual faculty perspectives rather than a standard definition of reflection.

Significance

A multitude of definitions of reflection exist as well as innumerable opinions about the importance it plays in medical education and practice. However, few empirical studies on reflection in medicine exist. The literature instead focuses on attempts to implement reflective practice and educational approaches, frequently discussing the theoretical benefits and uses of reflection as an isolated educational tool. The current study describes how people responsible for the education of medical students make meaning of all this information. Of all the possible definitions and purposes, which are sufficiently valued by faculty to merit assessment?

By promoting health and treating injury and disease, physicians play an important role in our society. Anything that can be done to improve their functioning can improve patient care. By addressing the meaning and assessment of reflection, this study will benefit medical educators by helping illuminate their thinking around these topics. Better understanding of the teaching of reflection would help future students to be more reflective practitioners which ultimately benefits patients.

The next chapter clarifies the conceptual context of the study by reviewing salient literature related to reflection, reflection in medicine, and the evaluation of reflection. Subsequent chapters address methods (Chapter 3), findings (Chapters 4-6), and discussion and conclusions (Chapter 7).

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the literature informing this study. In the first section, foundational literature informing much of the current work on reflection is described. Building on this literature, the next section addresses the role reflection plays in the way individuals learn to become a professional. Reflection is used and defined in specific ways in medicine and is outlined in the following section in order to provide a point of comparison to the school being studied. Next, conditions promoting reflection and the benefits of reflection are discussed. In these sections, I focus on medical education literature but also pull from other health professions, social work, and education literature. Lastly, assessment is discussed including difficulties in assessing reflection and some of the tools other have designed. Because this study looks at the means used to assess reflection, it is important to understand what others have found.

Defining Reflection

Reflection can have different meaning depending on the context and who is asked. In general, reflection can be defined as a cyclic process of self-regulation (Korthagen, 2001; Driessen, 2005) — a way for individuals to assess their own thinking and behavior in order to make adjustments. In an educational context, reflection is multifaceted in that it has different definitions, contexts and sources, and can be interpreted in many different ways (Boud, 1985; Moon, 1999). Although the terminology and level of detail varies, many authors outline levels or stages of reflection. After reviewing the literature on reflection available

at the time, Atkins and Murphy (1993) identified an overarching reflective process common to many of the theories. These include (a) a trigger of uncomfortable feelings or thoughts with a realization that current knowledge is not sufficient in the situation, (b) critical analysis which is an examination of feelings and/or knowledge, resulting in (c) new perspective/learning. The differing views presented in this section are compared and contrasted in a table using Atkins and Murphy's structure that can be found in Appendix B.

Most of the work on reflection in education recognizes John Dewey's contribution to the subject. Dewey (1933) defined reflective thinking as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions to which it tends" (p. 118). For Dewey, the purpose of reflection was "to enable us to know what we are about when we act" (p. 17). There is a pre-reflective stage in which identification and formulation of the problem occur. Critical analysis involves reasoning from the available evidence, developing a hypothesis and then testing the hypothesis. The new perspective gained allows the person to reformulate an outcome. For Dewey, reflection requires awareness of a true problem with an uncertain solution.

Kolb and Fry (1974) developed a model of experiential learning depicted as a circle or spiral in which learning can begin at any point along concrete experience, observation and reflection, forming abstract concepts, and testing new situations. Learning involves understanding the effects of actions and determining the general principle under which a particular instance falls.

Theoretical knowledge is part of the shared meaning, but a portion is of the knowledge is always idiosyncratic. Each new example expands or alters understanding (Eraut, 1994). Experience is used to change theories.

Knowles's (1975) theory of adult learning addresses reflective thinking but limits it to interpretation of data, application of facts and principles, and logical reasoning. For Knowles, this kind of thinking enables individuals to direct their own learning. Reflective thinking is prompted when there is some change in life events. Reflective thinking is for immediate application. The person must consider data, facts, and principles to solve whatever problem brought about this change.

Schön (1983, 1987) proposes a strong association between reflection and practice. His work influences much of the recent work on reflection. For Schön, the purpose of reflection is to deal with something puzzling, troubling, or interesting in order to promote new understandings. Reflection is prompted by surprise. Analysis of outcomes, action, and intuitive knowing results in an enriched practice repertoire. According to Schön, there are two types of reflection: reflection-in-action and reflection-on-action. Reflection-in-action is thinking-while-doing. It is prompted by surprise or by wonderment. More routine events and cases require little analytical effort on the practitioner's part because they have encountered the problem before. Reflection-in-action is automatic. We are often unaware of learning. We may have been aware at one time, but this is no longer available to us. When reflecting-in-action, the practitioner allows him/herself to feel puzzlement at something falling outside of ordinary

experience, to question prior understanding, and to develop something new (Schön, 1983, p. 68). According to Schön, we know more than we can say. Reflection-on-action happens after the event and involves looking back at our actions and exploring why we acted the way we did. Because it is difficult to verbalize the tacit knowledge that makes up practice and reflection-in-action, it is through reflection-on-action that we begin to understand the theories that are driving our practice. It is important to incorporate earlier experience with the problems of practice. Greenwood (1993) criticizes Schön's model for ignoring reflection before action (goal directed behavior) saying that the practitioner must reason intentions from actions. However, the surprise that initiates reflection may result from a deviation/discrepancy between a goal-directed behavior (plan) and the outcome (Jones, 1995).

Boud, Keogh, and Walker (1985) define reflection as recapturing, thinking about, mulling over, and evaluating experience. The general goal of reflection is to reconstruct experience though it may not be clear to the learner at the time. For Boud, Keogh, and Walker, the prompt to reflect does not have to be a negative event. In fact, as individuals become better at reflecting their own affect may more often be the prompt. They identify three aspects of reflection (adapted from Dewey) which include (a) returning to experience, b) attending to feelings, and c) evaluating experience. The outcome of reflection is affective and cognitive change which may not lead to behavioral change. Unlike Schön (1983, 1987), according to these authors, simply looking at behavior will not tell us whether reflection has occurred or not. One of the contributions of their work is the

attention to emotion, but the three aspects do focus mainly on what Schön defines as reflection-on-action rather than reflection-in-action.

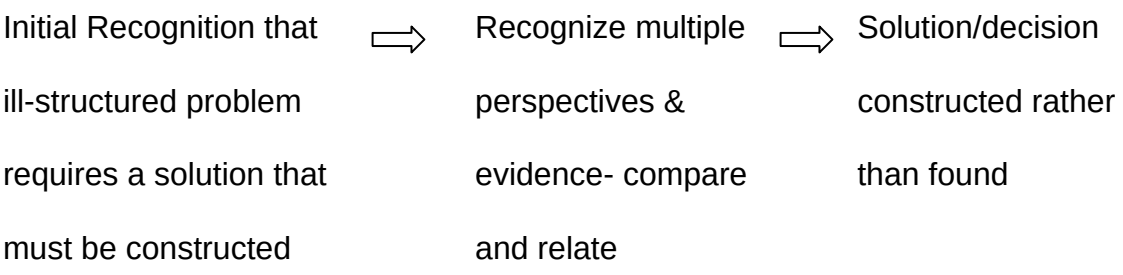
Learning theorists tend to frame reflection as thoughtful action, but Mezirow (1991) holds that thoughtful action doesn't necessarily imply reflection. He proposes confining the term to Dewey's definition of reflection as validity testing. Mezirow builds upon Dewey to examine how expectation might affect reflective thought. His types of reflection relate to focus: (a) content which describes the problem, b) process which involves strategies and procedures for solving the problem, and c) premise which is a critique of presuppositions. Reflection can be used both retrospectively and as part of planning for the purpose of finding similarities and differences between current and prior experiences, making generalizations, identifying patterns, and deciding on next steps. The evaluative piece, which Mezirow considers essential to developing a new perspective, may include many possible paths. The outcome is what he terms reflective action of which there are two subcategories. Reflective learning involves examining and critiquing assumptions and becomes transformative if the assumptions are found inauthentic or somehow faulty and in need of revision or creation of a new scheme.

Dewey's (1933) proposed association between reflection and critical thinking has remained strong with reflection sometimes used interchangeably to mean critical thinking or problem solving--particularly in medicine. Although many use the terms synonymously, King and Kitchener (1991) argue that traditional definitions of critical thinking and their own definition of reflective judgment can

be distinguished by the thinker's epistemological assumptions as well as the structure of the problem. For individuals who assume knowledge is authority based, problem solving becomes a quest to find the best authority to answer the question. Traditional definitions also assume that problems can be well-defined. If there is one correct answer, there is no reason to consider multiple alternatives. Uncertainty is a temporary state until the "right answer" can be discovered. King and Kitchener (1994) describe seven stages of reflective judgment that build upon each other. Higher stages are more complex, abstract, and contain more systematically interrelated subcomponents. Individuals may be in more than one stage at the same time. The first three stages are considered Pre-Reflective Thinking in which the person does not perceive or acknowledge that knowing is uncertain. In other words, people in these stages do not understand there is a problem. Stages four and five are considered Quasi-Reflective Thinking showing some intermediate level of thinking such as recognition that knowledge is contextual and subjective (Stage 5).

The last two stages are designated as Reflective Thinking, which the authors equate to Dewey's (1933) Reflective Thinking/Reflective Judgment. In these stages, individuals understand that knowledge is not given— it must be actively constructed and understood in context. At Stage 6, knowing requires action from the knower. The individual realizes the solution takes some intervening thought. Stage Six may involve judgment based on expert opinion, but the person has to have evaluated the expert's credibility.

Figure 1: King and Kitchener's Reflective Process



In Stage 7, reality is never a given; evidence and opinion can be synthesized into justifiable conjectures about the problem. Knowledge is the outcome of reasonable inquiry and beliefs are justified probabilistically based on a variety of considerations and weighing of evidence. At this level, individuals critique previous conclusions and develop their own hypotheses. Criticism is applied to self as well as others. The purpose of reflection is to find solutions to ill-structured problems, however, it should be noted that these stages are apparent in examining reasoning behind solutions and are not necessarily in an individual's awareness.

Jarvis (1987, 2006) used Kolb's model with adult groups to demonstrate different responses to a situation. His model included non-learning, non-reflective, and reflective learning responses. Jarvis' reflective practice (type of reflective learning) is similar to Schön's (1983,1987) ideas of reflection-in-action and reflection-on-action.

These definitions inform much of the literature about reflection as it relates to professional preparation and practice. In the next section, I discuss the ways in which reflection in its various forms is used by individuals to learn and improve

upon practice. More specific understandings of reflection as used by physicians and medical educators will be discussed in later sections. This section is intended to set the groundwork for more specific understandings.

Reflection in Professional Learning

In order to fully understand the place of reflection in professional practice, it is important to explore how individuals learn to become professionals and how they learn about and from their practice. Traditional definitions suggested "professions" were applied sciences and technologies. But there is more to professional practice than simply using a theory in some real life situation. This technical rationality equates practice with problem solving, but according to Schön (1983), this emphasis ignores the importance of problem setting. Problems of practice are not neatly packaged and presented to professionals for their solving. Instead the professional must define the problem and name those things to which he or she will attend. The unique and unstable elements in situations require practitioners to determine not only the solution but the nature of the problem, rendering simple application inadequate to address problems of practice.

Educators of professionals encourage reflection because it helps students learn and improve practice. If only technical knowledge was needed to practice, reflection would not be necessary. Students could simply learn the specific steps and knowledge needed for success. Instead the activity of professionals requires both technical knowledge and practical knowledge. Technical knowledge can be precisely formulated, but practical knowledge is expressed in customary ways of

doing things and can only be learned through interacting with someone who is practicing (Oakeshott, 1962). The rules of practice may be complete or incomplete. Complete rules guarantee success if followed. Incomplete rules provide suggestions designed to minimize failure but cannot account for uncertainties and complexities. According to Scheffler (1960) the degree of certainty in rules of practice creates a continuum of practice from technology to craft to art. The goal of practice is “wise action” and although this may require specialized knowledge, judgment is key (Harris, 1993). The art of a profession is making decisions in the face of this uncertainty. Harris urges educators to give greater attention to helping aspiring professionals and experts develop and maintain this artistry through reflection-in-action and reflection-about-action.

Participation in practice produces meaningful knowledge, and part of what defines a particular profession is the specialized body of knowledge held only by members. According to Eraut (1994) there are four types of professionally relevant knowledge. These can be explicit or tacit and include (a) Propositional Knowledge— knowledge of facts, theories, concepts, principles; b) Personal Knowledge—intuitions and interpretations acquired through experience; c) Process Knowledge— awareness of how to accomplish a task- gathering information, performing procedures, metacognition; and d) Know-How— understanding how to get things done that is often not formally taught but rather learned through hidden curriculum. Although Schön’s (1983, 1987) work on reflective practice has been influential, he has been criticized for ignoring the role of this specialized knowledge. This criticism is somewhat misguided, however,

because the ideas are actually complementary if you interpret reflective practice as informing which portions of the knowledge base are applicable in a given situation (Harris, 1993).

Reflection is especially important if you consider knowledge to be constructed—you must be aware of what you bring to the encounter (Mamede, Schmidt, and Rikers, 2007). “When practitioners are unaware of their frames for roles or problems, they do not experience the need to choose among them. They do not attend to the ways in which they construct the reality in which they function,” (Schön, 1983, p.310). Scott, Brown, Lunt, and Thorne (2004) draw attention to the external forces that may become part of a thinker’s consideration— recognizing that practice may be the initiating event for reflection, but so may be occurrences from outside of the workplace. They suggest that the key to understanding reflection is to understand the focus and reason for reflection, and identify foci for professional students’ reflection including workplace, identity, policy, institution, and innovation.

Socialization

Becoming a professional is more than simply acquiring knowledge. Professions are cultural tools with mechanisms for including and excluding entrance and teaching newcomers about being a member. This process is known as socialization. According to Wertsch et al. (1995), socialization is largely about appropriating existing strategies (ways of doing, thinking, and being), which then reproduce cognitive and social order. Practice cultures refer to shared and unarticulated tacit knowledge which facilitates communication between members.

It is through participation that individuals develop an identity as a community member (Wertsch & Rupert, 1993; Lave & Wenger, 1991; Polanyi, 1964). Therefore, attempts to build community are really about building an identity.

Socialization is not, however, a passive process. New members must reflect upon their own thoughts and behaviors in relation to the external information they are receiving about how a professional thinks and behaves. Formal education and learning through practice are common mechanism for teaching new members both the content of practice and professional culture. Much of professional learning occurs through activities that provide opportunity to practice (i.e., experiential learning).

Experiential Learning

Learning produces both meaning and identity. Schön (1983) describes a reflective practicum as a mode of education and initiation that provides an opportunity for novice and expert practitioners to reflect together. Learning through doing is an important part of professional preparation and continued learning. According to Eraut (1994) most innovations and changes in practice take place in the context of use, not formal education. Professional's learning tasks are more like problem solving than mastering proven procedures. Reflective learning can be difficult and risky for those already practicing because the process involves putting aside skills that have worked and risking mental overload because less is taken for granted (McLaughlin & Marsh, 1978).

According to Eraut (1994), there is little acknowledgement of knowledge gained through experience (action knowledge). Theory is usually explicit in "book

knowledge" and implicit in "action knowledge;" thus, people have a difficult time verbalizing knowledge gained through experience (Eraut, 1994). This does not imply this type of knowledge is unimportant but rather difficult to articulate and explicitly teach. Because tacit knowledge is dynamic, continually being built, and inherent in practice, it does not transfer easily or directly. Theories of situated cognition suggest that learning should take place in situations very similar to the ones in which the person will use the information, but these theories provide no notion of transfer to new situations which is an important concept in workplace learning (Reimann, 2001). In order to transfer action knowledge to new situations, further learning involving reflection is required (Eraut, 1994). When becoming a professional, individuals learn not only specialized knowledge but also the values that members commonly hold.

A strong connection to learning, especially experiential learning has made the idea of reflection interesting to educators. This has lead some to approach reflection as an educational tool— a way to incorporate deeper thinking into the curriculum in order to enhance learning. But there is a risk of using reflection superficially when trying to incorporate it into a curriculum. Harris (1993) warns against simply using reflective practice as a slogan and suggests that a deeper understanding is necessary. Similarly, Boud and Walker (1998) caution against using a checklist mentality when trying to prepare young professionals. There is a danger of emphasizing reflection without linking to conceptual frameworks in that students may not understand why they are being asked to reflect. Boud and Walker also warn that some early professionals might not be capable of the level

of personal reflection that some programs may demand and suggest providing opportunities for coaching.

The Role of Values in Practice

According to Argyris and Schön (1974), people design their actions even though they may not always be able to articulate the design. Actions are not accidental. There may be differences between espoused theories-of-action (what people believe they base their behavior upon) and their theory-in-use (values implied in their actions). An individual's values (governing variables) influence choice of behavior (action strategy). In general, people choose behaviors that match their values within some acceptable range. Strategies (behaviors) have both intended and unintended consequences. If the outcome does not match what the person intended, he or she may try a new strategy (single-loop learning). The person may also change the values that directed the choice which would also change the action. This is known as double-loop learning because both the governing variable (value) and the strategy (behavior) are changed. Medical students have difficulty transferring the values they are taught in the pre-clerkship curriculum to their clinical years. Values espoused by programs may even conflict with each other. For example, taking more time to let a patient tell her story may be considered more patient-centered but if doing so makes you late for seminar, you may be perceived as acting unprofessionally.

Bringing espoused and theories-in-use into alignment can increase effectiveness (Argyris, 1980). Reflection helps expose areas of incongruence which has two-fold significance for this dissertation. First, students' reflections on

their strengths and weakness related to practice competencies may bring to light incongruence between espoused values and students' theories-in-use. Second, analyzing the faculty's use of reflection in medical education may reveal inconsistencies that provide students with mixed messages.

Reflection in Medicine

For physicians, reflection is an important part of professional preparation and practice. In general, the ability to reflect is valued by the medical profession and seen as necessary to practice. Doctors deal with complex problems and must be able to reflect in order to function professionally while adapting to their patient's needs. Although there has been enthusiasm about the use of reflection in medicine and medical education, the literature has been limited. While studies of reflection are prevalent in teaching and nursing expertise literature, they are not as common in medicine. In 2004, Mamede and Schmidt commented on the lack of empirical studies of reflection in medicine with the literature instead focusing on attempts to implement reflective practice and educational approaches. Although there have been additional empirical studies in the last five years (which are addressed in this chapter), this general characterization of the literature still holds.

Aukes, Geertsma, Choen-Schotanus, Swierstra, and Slaets (2007) outline three types of reflection in medicine— clinical, scientific, and personal. Each of these types will be discussed in turn. Scientific reflection and clinical judgment are most emphasized and are also called problem solving, decision-making, or critical thinking. Coleman, Rogers, and King (2002) define critical thinking in

terms of open-mindedness and ability to seek answers to ambiguous problems which is close to the definition of reflection often used in medicine.

For many in medicine, reflective practice means critically looking at one's own reasoning and decisions. This is a valued competence in medicine (Mamede & Schmidt, 2007). Reflection has also been related to a physician's diagnostic abilities (Sobral, 1995) discussed in greater detail in the section on benefits of reflection. Sobral (2000) looks at reflection-in-learning as a pre-skill to reflection-in-action which is part of the diagnostic thinking that students will do once in medical practice. The ability to think critically about how and what one is learning is a building block for the diagnostic reasoning students will use in medical practice.

Based on the results of a survey influenced by the work of Schön and Dewey, Mamede and Schmidt (2004) propose five dimensions of reflective practice in medicine. Described below, these dimensions represent a hybrid of the scientific and clinical types of reflection described by Aukes et al. (2007):

(a) Deliberate Induction- generating possible alternative explanations

(b) Deliberate Deduction- from the general alternative explanation what symptoms would be expected?

(c) Testing hypotheses against problem

(d) Attitude of openness toward reflection- must be able to tolerate ambiguity and uncertainty and be willing to reflect.

(e) Meta-reasoning- thinking about thinking and reviewing assumptions.

They found that Meta-Reasoning and Deliberate Induction were correlated, as were Openness and Deliberate Deduction. Some participants reported rarely engaging in deliberate reflective practice while others routinely do so. The assumption is that doctors who regularly reflect provide better care.

There is less literature linking reflection to clinical judgment (Tanner, 2006). Clinical judgment is complex and involves taking scientific knowledge and making interpretations in light of not only the individual patient but also the patient's needs and preferences (Mamede & Schmidt, 2007). As mentioned earlier, critical thinking is often emphasized as the major activity of clinical judgment. However, based on a review of more than 200 articles, Tanner (2006) proposes a model of clinical judgment in nursing that emphasizes background experience, knowledge of the patient, and context/culture of the unit. Rather than only critical thinking, a variety of reasoning patterns are used to make clinical judgments. It seems reasonable to assume physicians also use varied forms of reasoning in making clinical judgments.

Personal reflection is reflection-ON-experience and focuses on sense-making. This type of reflection is less emphasized in medicine because it tends to be seen as a personality trait or private attitude outside of the medical toolkit (Coulehan, 2005). Aspects of reflection perceived as "soft" do not tend to be as emphasized in medicine. For example, in discussing the use of reflective portfolios in medical education, Driessen (2005) points out that reflection in teacher education usually places more emphasis on identities and beliefs "because these are regarded as crucial to their professional development"

(p.1235). It is fascinating that identities and beliefs are not considered “crucial” to medicine.

Rather than a personality trait or private attitude, others view personal reflection as an important component of a physicians’ ability to adapt to different situations in a professional way. Aukes et al. (2007) define personal reflection as “the exploration and appraisal of one’s own and other’s experiences, thus clarifying and creating meaning, for the benefit of balanced functioning, learning and development” (p. 178). This view recognizes that others’ experiences may provide a basis for reflection, meaning making, and learning. Similarly Boenink, Oderwald, De Jonge, Van Tilburg, and Smal (2004) define reflection as “the conscious weighing and integration of views from different perspectives” and include both self-assessment and moral reasoning in their understanding. These authors assert that reflection is necessary for the development of a physician’s balanced professional identity (p. 368).

Others take a more global perspective not limiting reflection to scientific, clinical decisions, or personal experiences. Instead, Epstein (1999) informed by Eastern philosophy speaks of a mindful practitioner as one who "attends, in a nonjudgmental way, to his or her own physical and mental processes during ordinary everyday tasks to act with clarity and insight” (p. 2) and suggests that mindfulness is integral to competence in medicine. From his point of view, medical decision-making derives from explicit knowledge and tacit knowledge (learned through observation and practice). Most of the tacit knowledge remains unconscious including context, cost, convenience, values of the patient, and

physician factors such as emotions, bias, and prejudice. Mindfulness brings the tacit to consciousness. It is an expansion upon the idea of Reflective Practice and highlights the interdependence of action, cognition, memory and emotion. The goal of mindful practice is to become aware of one's own mental processes and biases and become more flexible in order to act more compassionately. Epstein (1999) proposes the following Levels of Mindfulness:

0) Denial and Externalization— the problem as "out there", person may avoid responsibility or reflection.
1) Imitation/Behavioral Modeling—takes some responsibility, but uses external behavioral standard to resolve situation.
2) Curiosity/Cognitive Understanding—makes decisions based on cognitive models. Reflects to generate hypotheses but ignores personal knowledge, tacit knowledge, and emotions.
3) Curiosity/Emotions and Attitudes—shows curiosity about feelings, thoughts, and behaviors without labeling them as good or bad.
4) Insight—shows understanding about the nature of a problem, how to attempt to solve the problem, and the interconnectedness of practitioner and knowledge.
5) Generalization/Incorporation and Presence—uses insight to generalize. Incorporates new behaviors and attitudes and shows compassion.

Mindfulness can be applied to any aspect of medical practice. It is not just about critically reflecting on symptoms and diagnosis or personally reflecting on

feelings related to a patient. Mindfulness in medicine is about (a) intrapersonal self-awareness related to strengths, limitations, personal history and how it influences practice; (b) interpersonal self-awareness related to seeing yourself as others see you and developing relations with colleagues and patients; and (c) awareness of ones own thinking (metaprocessing) related to clinical reasoning, connections between cognition, memory, and emotion. Epstein (1999) suggests that personal knowledge is a component of data that should be considered as part of an evidence-based practice, and it is personal knowledge that links evidence-based and relationship-centered care.

George Engel (1977) proposed the biopsychosocial model of clinical care more than 30 years ago. This model acknowledges the patient's subjective experience as important to accurate diagnosis, outcomes, and humane care. Borrell-Carrió, Suchman, and Epstein (2004) recognize the important contribution of this model but suggest the need to change the clinician's stance from objective detachment to reflective participant. The duality of mind/body can be complicated by viewing knowledge as socially constructed. The physician is morally obligated not only to treat the patient as a person but to care for and deepen self knowledge for

> Without a sufficient degree of self-understanding, it is easy for the physician to confuse empathy with the projection of his or her needs onto the patient . . . . The physician who sees his or her role as nothing more than a technical adviser can regard empathy as a useless effort that has no influence on clinical decisions, or, worse, a set of linguistic tricks to get the patient to comply with treatment (Borrell-Carrió et al., 2004, p. 579).

They propose more emphasis on human warmth, understanding, generosity, and caring. While incorporation of clinicians' experience is a tenet of evidence based

medicine, this aspect has not been as well described as methods for judging quality of scientific evidence (Borrell-Carrió et al., 2004).

Recently there has been renewed focus on professionalism in medicine and one of the key areas of emphasis is on a physicians' ability to critically reflect on his or her decisions (Mamede & Schmidt, 2004). However, Hilton and Slotnick (2005) assert that professionalism in medicine involves a practical wisdom that only comes with prolonged experience. Students and beginning professionals exhibit what they term "proto-professionalism." These authors argue that rather than a trait, professionalism is a state that must be maintained: "Skills, knowledge, and experience are necessary for professionalism, but sophisticated reflection on the doctor's part is also required to produce insights enabling the individual to better address the needs of patients specifically, and society generally" (Hilton & Slotnick, p. 59). These authors identify six domains of medical professionalism. Three personal (intrinsic) attributes include ethical practice, reflection and self-awareness, and responsibility/accountability for actions including commitment to excellence, lifelong learning, and critical reasoning. The other three are cooperative attributes including respect for patients, teamwork, and social responsibility. They settle on a definition of the mature medical professional as "a doctor who is reflective and acts ethically" (p.61) assuming that these two characteristics subsume all of the other domains. Students and early professionals are developing but have not yet achieved professionalism.

In addition, experience both builds and breaks down professionalism. It is a state not a static trait. The mature professional has knowledge, skill and practical wisdom (insight and judgment based on experience). This relates to Schön's (1983) knowledge in action, Polanyi's (1967) tacit knowledge, and Eraut's (1994) personal knowledge and know-how. An important function of medical education then is to provide role models to "demonstrate how to reflect on ill-structured problems and their associated ethical problems" (Hilton & Slotnick, p. 63). Evidence of protoprofessionalism should be sought not only in behavior and interactions with others, but also in students' own observations on their learning.

Conditions Supporting Reflection

Although reflection is often a desired educational outcome, students often have difficulty with the task. Although enhancing reflective ability is frequently emphasized in the literature, there is little evidence that these efforts actually work (Fund, 2002). The best students already reflect on their learning and set learning goals, but most students do not do this; however reflection can be encouraged (Williams, 2002). Dobie (2007) asserts that self-awareness should be intentionally taught in medical education as it is abstract and students often miss the connection with patient centered care.

Comparing Obstetrics-Gynecology clerkship students' final grades to the students' self assessments of knowledge, personal attitude, clinical problem-solving skills, written/verbal skills, and technical skills; Weiss, Kollwer, Hess, and Wasser (2005) found that students were not aware of their personal attitudes or

how these attitudes influenced their effectiveness as a physician. In addition, when given tasks intended to encourage reflection, students mostly describe rather than reflect (Woodward, 1998). Despite this fact, there are some conditions in which reflection seems more or less likely to occur. This section addresses individual and contextual variables that support and detract from reflection.

Some in teacher education claim that because the work of teachers is now so demanding and busy, reflection is unlikely to develop without a concerted effort started during teacher training (Fund, Court & Kramarski, 2002; Hatton & Smith, 1995). Physicians' work is also very demanding and complex, so targeting reflection in the training in medical education also seems wise. Reflecting in the classroom, however, is not the same as reflecting in a stressful clinical situation and Epstein calls on practicing clinicians to model this kind of reflective and mindful practice for medical students (Epstein, 1999).

One way education programs promote reflection is through encouraging students to do reflective writings. These exercises encourage students to think about relevant experiences. Narrative thinking (thinking through telling and interpreting stories) involves trying to understand a particular case (Brunner, 1986). Having and telling stories turns knowledge into understanding (Astrom, Norber, Hallberg, & Jansson, 1993; Benner, Tanner, & Chelsea, 1996). So the act of reflecting and telling stories helps students to translate what they are learning into understanding they can use with their patients.

Several skills and abilities are necessary to reflection including self-awareness, the ability to describe uncomfortable feelings, the ability to identify knowledge and challenge assumptions (critical analysis), the ability to integrate new learning, and the ability to judge the value of something (Atkins & Murphy, 1993). In addition to skill and ability, researchers have suggested other individual variables influencing reflection including age and experience. A level of maturity and willingness to reflect also make a difference (Sobral, 2000).

While reflection may require maturity, to some extent experience actually discourages reflection. Mamede and Schmidt (2005) asked 202 primary care physicians questions related to characteristics, education, and work environment. They found that reflection was negatively correlated with age and years of experience. These findings are consistent with Norman and Brooks (1997) and Schmidt and Boshuizen's (1993) work— experienced physicians tend to use more non-analytical methods when dealing with usual cases. Mamede and Schmidt even go so far as to say physicians are *not expected* to use reflection when faced with usual cases. It is when they deal with unusual cases or face difficulties that reflection is prompted. Experienced physicians may still use reflection to reduce uncertainty in complex and unusual problems (Mamede & Schmidt, 2005).

Mylopoulos and Regehr (2007) note that the assumptions of the cognitive model of expertise unnecessarily limit conceptions of expertise in medicine. Frequently diagnostic ability has been emphasized. Traditional cognitive approaches seem to assume that expertise is an end-state of mastery of existing

knowledge and technique. There has been some work done making the distinction between “routine expertise” and “adaptive expertise.” Routine expertise is more about a way of being — an approach that is flexible and not only about applying past knowledge but may involve generating new knowledge. Adaptive expertise, on the other hand, is a set of habits used by the practitioner.

My review of the literature revealed that reflection was positively correlated with identification of hospital as the primary work location and with certain specialties. Mamede and Schmidt (2005) assert that because certain specialties and locations of practice provide more opportunities for unusual and complex problems, physicians working in these circumstances have more opportunity to use reflection. For example, primary care physicians deal with a broad range of problems increasing the likelihood of encountering unusual problems. However, even in stimulating environments, reflection could be restricted by the number of patients and time available.

Some have asserted that trigger events usually prompt reflection (Benner, 1991; Wong, Kember, Chung, and Yan,1995; Boud and Walker, 1998). According to Tanner (2006), “reflection on practice is often triggered by a breakdown in clinical judgment and is critical for the development of clinical knowledge and improvement in clinical reasoning” (p. 204). In other words, something goes wrong that draws the physician’s attention to a gap in knowledge, skills, or experience needed to solve the problem. By working through the problem, the physician builds knowledge that can be used in the future. Professionals continually learn on the job via a succession of cases,

however, they may not increase their professional knowledge unless they see what they are doing as a special case. Even then, if they do not take the time to reflect, they may continue to just view the situation as a special case and might not integrate it into their knowledge base (Eraut, 1994).

Having someone else ask probing questions seems to promote deeper reflection. Baernstein and Fryer-Edwards (2003) found that faculty interviews of students prompted more in-depth reflection than writing alone. These authors were specifically interested in how reflection on professionalism could be encouraged within a fourth year emergency medicine clerkship. Professionalism was defined as the ethical and humanistic skills needed to practice medicine. A coding scheme was developed to measure the number and depth of professional issues, biomedical issues, and explorations addressed in each student interview or critical incident report (CIR). Means were compared, and it was found that students who did only interviews addressed more issues of professionalism than those who did only written critical incident reports. Doing CIRs in addition to interviews made no difference. Those students doing interviews had faculty to prompt additional explorations which resulted in deeper reflection than writing alone. Although touched upon throughout this chapter, the next section specifically describes the benefits of reflection to physicians and their patients.

Benefits of Reflection

Physicians must engage in various kinds of reflection throughout their career. Scott et al. (2004) outline assumptions prevalent in professional preparation literature and practice including (a) that if a student learns to reflect

and is allowed to put these skills into practice, then practice will improve, and (b) that reflection is always a virtue. These authors point out that reflection could actually make practice less effective if it leads the practitioner to be too self conscious or to question the moral basis of their actions. While acknowledging there may be some difficulties around reflection, in this section, I discuss the benefits of reflection to physicians and those they serve.

Lifelong learning is valued in medicine. Because scientific information is constantly growing, it is assumed that successful physicians are committed to self-assessment and will be self directed in identifying learning needs. Reflection is a necessary skill for self-directed learning because the individual must be able to consider his/her own strengths and weaknesses in order to pursue learning. Self-assessment, defined as a "learner's evaluation and appraisal of their own competence and performance" builds meta-cognition which is crucial to effective learning (Mok et al., 2006, p. 416; Paris & Paris, 2003). Thinking about what and how one learns (reflection-in-learning) helps students to take control of their learning (Boud et al., 1985; Sobral, 2000). Reflecting on what is known activates prior knowledge. Reflecting on what the student wants to know highlights motivation. Reflecting back on what is being learned helps construct meaning and anchor prior knowledge (Mok et al., 2006). Scientific reflection in particular helps medical students develop and expand knowledge (Brown & Gills, 1999; Glaze, 2001; Hyrkas, Tarkka, & Paunonen-Ilmonen, 2001; Paget, 2001); reflection helps improve clinical reasoning (Murphy, 2004); and personal reflection and improves judgment (Smith, 1998).

Whether during problem-based learning in the pre-clerkship years or clinical learning throughout medical school and residency, there are many opportunities for students of medicine to learn from experience. This learning is enhanced when students reflect upon the experiences they are having (Atkins & Murphy, 1993). In addition, Mitchell (1994) has found that learners who reflect are more satisfied and find learning experiences more meaningful. In addition, better understanding of reflection and its place in medical education will help future students to become more reflective practitioners which would ultimately benefit patients.

Current understanding of evidence-based medicine focuses on care of populations and tends to devalue the individual patient (Tonelli, 1998). Students enter medical school with the desire and intention to have good relationships with their patients but they often receive indirect messages that other things (i.e., biomedical knowledge) are more important. Dobie (2007) asserts that a cultural change is needed to encourage communication and relationship skills. The author states that there are opportunities in medical education to teach students how to reflect in order to help them better understand themselves thereby forming better relationships with their patients. Although participant self-determination and individualization are espoused values in other helping professions (Coleman, Rogers, & King, 2002), it seems that patient centered care may reflect a shift toward these values for medicine.

Whereas unexamined attitudes, biases, and stress can have a negative impact on patient care, a physician's personal development and well-being can

be promoted through medical education in order to ultimately contribute to the patient's well-being (Novack & Epstein, 1999). According to Epstein (1999), doctors gain the ability to observe patients while observing the self.

Our ideas about how people should act in a given situation are societal and cultural constructions. Since we all have slightly different experiences and positions in society, our perceptions may be slightly or radically different from others (Kuper, Reeves, Albert, & Hodges, 2007). Physicians bring their own culture, beliefs, and expectations to patient encounters. Students may assume *their* interpretation is universal unless they take the opportunity to reflect. Reflection requires the student to objectify their own behavior. Self-awareness helps them develop a relationship with the patient as well as set boundaries. I contend true personal reflection helps students to develop the skills and awareness to become more patient centered.

In addition to the patient care and relationship benefits, reflection may help physicians make fewer diagnostic errors. Mamede and Schmidt (2007) use literature to explore the relationship between reflection and diagnostic errors. Although there are almost no empirical studies that speak to this, the authors believe that there is good theoretical basis to assume that enhancing reflection would decrease medical errors—

in particular diagnostic errors. In general, those physicians that are more flexible and not defensive about having an early diagnosis disproved have fewer diagnostic errors. Those physicians using reflective practice spend more time

framing the problem and considering broader range of factors. Reflective doctors are more likely to recognize an unusual problem.

A multitude of definitions of reflection exist as well as innumerable opinions about the importance it plays in medical practice. In addition to personal/individual betterment, reflection can benefit not only the recipients of practiced services (in this case patients), but also the field itself. Reflection can encourage students to challenge existing theories (Kettle & Sellars, 1996). This questioning of traditional thought and ways of doing things can be beneficial to the field (Ferraro, 2000).

Assessing Reflection

There is much interest in reflection in medical education, but most of the attention has been directed toward implementing it into the curriculum with less attention given to the measurement of reflection (Aukes et al., 2007; Kember & Leung, 2000). Because programs measure what they value, assessing reflection communicates its importance to students. Although “teaching to the test” has negative connotations, assessment can encourage development of reflective skills because students tend to focus attention on what they believe will be assessed (Becker et al., 1968; Fallows and Chandramohan, 2001). The process of preparing for assessment becomes the stimulus for learning.

There are a number of problems associated with the assessment of reflection. One such problem involves the personal nature of reflection and a lack of agreement over what constitutes reflection (Stewart & Richardson, 2000). Some question whether students should be asked to reveal private thoughts

particularly when there is lack of agreement about what is being assessed. Students also show varying levels of resistance when asked to reflect. Fear of repercussions may lead students to provide only superficial narratives. Isaacson, Salas, Koch, and McKenzie (2008) describe the use of reflective writing at Cleveland Clinic Learner College of Medicine. Reflective writing is used throughout the five year program in the form of patient logs, journals, seminar papers, web logs, and forums for spontaneous sharing. The authors have found that students are initially skeptical of the process and approach the writings with varying levels of effort and depth. Students may feel awkward initially, but the guided writings provide a roadmap for a process that does not come naturally for some students. Some students recognized the value right away and started using purposeful reflection throughout their practice. Other students were more resistant.

Both students and faculty may feel uneasy with introducing reflection into the curriculum and assessment efforts. Using focus groups and supporting documents, Stewart and Richardson (2000) examined occupational and physical therapy student and faculty perceptions of attempts to encourage and assess reflection. These attempts included developing and reporting progress on a learning plan, responding to clinical scenarios, and reflecting on a patient specific critical incident. Student findings included the following: (a) a high degree of anxiety around reflection assignments, (b) perception that the assignments were personal and that answering honestly made them feel vulnerable, (c) having to write up the assignments was artificial, (d) perception that the assessment was

more about writing than actual reflection, (e) concern about consistency in grading, and (f) concern with inconsistent information depending on tutor. Faculty reported feeling uneasy assessing reflection, but the authors state that providing students and faculty very specific criteria makes assessing more abstract elements impossible. Stewart and Richardson (2000) suggest concerns could be addressed by encouraging reflection through modeling and small group activities with self-assessments throughout and only using formal assessments of reflection around clinical scenarios.

Assessments of reflection vary in focus. Some assessments focus on identifying types of reflection (Kember & Leung, 2000; Aukes, 2007) whereas others are more interested in judging the quality of evidence (Niemi, 1997). Some descriptions categorize reflection (Kember & Leung, 2000) while others are more developmental in nature (Fund, Court, & Kamarski, 2002). Lastly, assessments of reflection may be self-reported (Aukes, 2007; Sobral, 2000) or based on analysis of some form of evidence (Boenink, et al., 2004; Mok et al.; 2006, Stanton et al., 2007). The remainder of this section describes these assessments.

Niemi (1997) did a qualitative study analyzing learning logs and interviews of pre-clinical medical students using the following levels of reflection: (a) Committed Reflection: analytical, can take another's view and state own view , (b) Emotional Exploration: reflection is visible but based more on emotions, self conscious, rarely taking another's perspectives, (c) Objective Reporting: focusing on events and what happened rather than emotional reactions, questioning or

elaboration, and (d) Scant and Avoidant Reporting: Diffuse reporting, tended to be short or superficial. Logs and interviews were fairly evenly distributed across levels two through four. Committed Reflection was seen less frequently and was considered by authors to be a skill and sign of mature thinking. It was noted that students demonstrating committed reflection were more likely to have clearer views about their professional future. Scant and avoidant reporters were more likely to have considered quitting medical school.

Kember and Leung (2000) drew heavily on Mezirow's (1991) work but also on Schön (1983, 1987) and Dewey (1933) to develop a questionnaire to assess reflection. Their reflection scale included Habitual Action, Understanding, Reflection and Critical Reflection. Habitual actions (similar to Schön's Knowing in Action) are previously learned and automatically performed repetitive actions that come to take little thought to complete. For the experienced person these actions involve well defined problems. Understanding (derived from Bloom's Comprehension and Mezirow's Thoughtful Action) is defined as appreciation/awareness without assignment of significance. Reflection (related to Schön's Reflective Practitioner) involves raising questions and posing problems related to practice with experience being a main feature. Last Critical Reflection (similar to Dewey's definition and to Mezirow's Premise Reflection) involves becoming aware of why we think or perceive what we do (our assumptions). These authors administered their questionnaire with 303 health sciences students including nursing, occupational therapy, physical therapy, and radiography. Graduates achieved higher scale scores than undergraduates

indicating higher levels of reflection presumably because graduate students were currently in practice and had more experiences to draw from. Fewer students' scores indicated Habitual Action and Critical Reflection which the authors anticipated because each of these types of reflection generally take longer to develop than the other two.

Sobral (2000) developed a scale to measure medical students' reflection-in-learning—thinking about and what one has learned[1]. Participants took a 30 hour elective course intended to help them develop study skills and encourage them to take more responsibility for learning. The course encouraged reflection through small group activities. 103 students were course participants and 98 (the control group) were not enrolled. Measures included (a) 10-item self-reported self-reflection, (b) 11-item competence for self-regulated learning, (c) 36-item meaningfulness of course, and (d) diagnostic ability. Those in class, for the most part, showed a small positive change in reflection level. Self-regulation of learning was correlated with reflection but was even higher after the course. Reflection was correlated with meaningfulness at the end of the experience which confirmed Mitchell's (1994) finding on meaningfulness and reflection. Reflection and diagnostic thinking AND reflection and grade-point-average (in the term after the course) were correlated at the end. Groups with positive change and high level Reflection-in-Learning had higher GPAs and higher self-reported diagnostic ability.

[1] I would probably be more inclined to refer to this as reflection on learning since the assessment really asks the student to look back on their learning.

Fund, Court, and Kramarski (2002) assessed the content and form of student teachers' weekly personal documents related to their previous lesson. Students completed a self-assessment and were given a list of suggested questions to address in their reflections. Students were given prompt feedback. In addition to content the authors also analyzed the form by assigning the following designations: (a) Description (b) Personal Opinion, (c) Linking (self-contained associations with previous knowledge), and (d) Critical Bridging (deeper deliberation of a problem or issue with some reference to possible alternative opinions from the literature). In looking at four documents over time, form changed however content did not. Content was consistent over time with about 58% concentrated on "what" happened, 29% on "how" it happened, and 13% related to "I"- their personal experience of the event. Linking first went up then back down. The authors propose that linking is an intermediate skill—that students move from description and personal opinion into linking then to critical bridging. Participants included personal experiences about the same amount over time which makes sense given the nature of what they were being asked to do—the student cannot take themselves out of these narratives but can show more sophisticated linking and critical bridging.

Boenink et al. (2004) describe the development of an instrument to measure students' ability to reflect on their performance in medical practice. Students were asked semi-structure questions about a group of vignettes. Responses were scored on two dimensions (a) overall reflection, and (b) extent to which they incorporated others' perspectives into their reflections. The

relationship between overall reflection and inclusion of other's perspectives were quantitatively analyzed in terms of gender, career preference, and work experience. They found that women, those with experience in healthcare, and those considering careers in general practice had slightly higher scores and that the scores on the two measures were strongly related. Students did not often consider others' perspectives in their reflections.

In a qualitative study by Mok et al. (2006), self-assessment was used in five different teacher education programs. Self-assessment was defined as a "learner's evaluation and appraisal of their own competence and performance" (Mok et al., 2006, p. 416). Students were directed to use the Know-Want-Learn method (Ogle, 1986) to write about what they know (K), what they want to know (W) and then afterward what they learned (L). Using self-assessment builds meta-cognition which is crucial to effective learning. Students' level of learning was assessed from their writings about what they know (K) and from writings after learning (L). The learning levels, adapted from Biggs and Collis (1982) SOLO taxonomy, were compared. These levels increase based on greater sophistication related to the integration of information. Across all 5 case studies, about 60% of students went up levels between the K and L stages. About 30% stayed the same and 10% actually went down. The authors do not speculate why some students' levels decreased.

As mentioned earlier, in medicine reflection is often assumed to mean scientific reflection. Personal reflection is seen as hard to define and more akin to private attitudes (Coulehan, 2005). Aukes, Geertsma, Choen-Schotanus,

Swierstra, and Slaets (2007), however, assert that a physicians' ability to adapt to different situations in a professional way is dependent upon his or her ability and willingness to use personal reflection. Aukes et al. (2007) developed a tool for examining personal reflection that they defined as "the exploration and appraisal of one's own and other's experiences, thus clarifying and creating meaning, for the benefit of balanced functioning, learning and development" (p. 178). This group focused on reflection on experience and sense-making. The tool has 23 items rated on a 5-point scale and can be administered in less than 10 minutes. A factor analysis revealed three aspects to personal reflection: (a) self-reflection which is introspective and a prerequisite for framing or reframing thoughts, feelings, norms or methods; (b) empathetic reflection which is social, inter-subjective, contextual understanding and appraisal; and (c) reflective communication which is the behavioral expression of the two previous. This is a self-reported tool, so it assumes some level of self reflection in order to answer the questions (the authors do acknowledge this limitation).

Stanton, Mayer, Oriol, Treadway, and Tosteson (2007) describe a program that requires students to develop a casebook based on multiple experiences with a single patient. The casebook addresses topics related to the patient including medical and other issues. The goal of the book is to provide an opportunity for students to integrate what they are learning in class. The program requires students to show some reflection in their casebooks instructing them to "consider their own reflections and become observers of the world around them" (p. 518). The assessment asks faculty to rate how well the student expresses

“his or her feelings, conflicts, dilemmas in dealing with the patient and the illness." This is similar to the Aukes et al. (2007) definition of personal reflection which shows that despite general discomfort with more personal forms of reflection, at least some medical educators value more than just the clinical and scientific aspects of reflection.

Portfolios

Learning occurs when students make sense of their experiences and portfolios encourage students to self reflect and self assess. Portfolios offer the opportunity to reflect on performance, show progress, and showcase best work (Williams, 2002). In teacher education and increasingly in medical education, portfolios have been used both to encourage and to assess reflection. Portfolios are relevant to this research because the medical school under study uses an electronic portfolio that contains information related to students’ performance in coursework including grades and other types of evaluations as well as responses to structured reflection questions. The medical school plans to increase the relevance and visibility of the portfolio in the near future.

Portfolios are also relevant because there is movement toward using portfolios for the recertification of practicing physicians. This type of portfolio would follow a physician throughout his or her career. However, Wilkinson et al. (2002) warn of the risk of losing some of the benefits of portfolios when used summatively rather than formatively. Using portfolios in a relatively high-stakes manner often leads planners to set more prescriptive standards for completion. Standard setting can increase reliability but does stand the chance of sacrificing

some of the learning benefits. In order to truly be a portfolio rather than a simple log or "suitcase" for documentation there must be evidence of continued critical evaluation of performance (Wilkinson, 2002).

Although portfolios offer great educational possibility, problems have been noted such as the increased workload necessary to provide feedback to students; the difficulty students have in making connections between portfolio and course objectives; and administration concentrating on grading rather than the learning opportunities (Williams, 2002). Others have found that students who are not accustomed to the portfolio format may become more concerned with how much to include (quantity) rather than the “what” and “how” (Coleman, Rogers, & King, 2002). And it cannot be assumed that using portfolios guarantees that students will reflect (Pearson & Heywood, 2004). Because of these problems, some faculty express skepticism when it comes to the use of portfolios. Williams (2002) suggests mapping portfolio objectives to course objectives in order to prove the efficacy to faculty (Williams, 2002).

Driessen, Van Tartwijk, Overeem, Vermunt, and Van Der Vleuten (2005) used grounded theory to analyze interviews from thirteen experienced medical educators. These interviews focused on the definition of reflection, effectiveness of portfolios to stimulate reflection, and the conditions of successful portfolio use. Definitions of reflection focused on professional attributes and the identification of strengths and weaknesses. Interestingly, the mentors also focused on reflection requiring a student to take positions from outside their own perspective. Mentors thought that portfolios encourage students to manage their own development,

take a more critical view of their own performance, and that ability, attitude, and motivation made a difference in the effectiveness of a portfolio experience. These experienced faculty thought that role modeling and asking students thought provoking questions as well as providing more structure in the beginning helped create successful reflective portfolio experiences. Faculty also thought that mentors and students would take the portfolio process more seriously if it carried the weight of a summative evaluation and emphasized identifying those students lacking the ability to critique their own performance as they considered this a central skill for physicians.

Understanding others approaches and difficulties faced by others assessing reflection provides a point of comparison when analyzing how the medical school in the current study assesses reflection. These studies provide both examples and counter- examples from which to compare.

Conclusion

Reflection is multifaceted in that it has different definitions, contexts and sources, and can be interpreted in many different ways (Boud, 1985; Moon, 1999). Although the terminology and level of detail varies, many authors outline levels or stages of reflection. The influence of Dewey's (1933) proposed association between reflection and critical thinking has remained strong with reflection sometimes used interchangeably to mean critical thinking or problem solving--particularly in medicine. Schön's (1983, 1987) proposed association between reflection and practice also influences much of the recent work on reflection particularly around work in the professions.

In order to fully understand the place of reflection in professional practice, it is important to explore how individuals learn to become professionals and how they learn about and from their practice. Professionals not only apply knowledge to solve problems, they must define the problem and decide which things should command their attention (Schön, 1983). If only technical knowledge was needed to practice, reflection would not be necessary. Students could simply learn the specific steps and knowledge needed for success, but educators of professionals encourage reflection because it helps students learn and improve practice.

Formal education and learning through practice are common mechanisms for teaching new members both the content of practice and professional culture. Reflection also plays a part in the development of professional identity including the integration of personal and professional values. Socialization is not a passive process. Entering members must reflect upon their own thoughts and behaviors in relation to the external information they receive about how a professional thinks and behaves.

For many in medicine, reflective practice means critically looking at one’s own reasoning and decisions. Aspects of reflection perceived as “soft” do not tend to be as emphasized. This type of personal reflection on experience is less emphasized in medicine because it tends to be seen as a personality trait or private attitude outside of the medical toolkit (Coulehan, 2005). There are some, however who do not limit reflection to scientific, clinical decisions, or personal experiences; Epstein (1999) speaks of a mindful practitioner as one who "attends, in a nonjudgmental way, to his or her own physical and mental

processes during ordinary everyday tasks to act with clarity and insight" (p. 2) and suggests that mindfulness is integral to competence in medicine.

Certain conditions seem to promote and others to discourage reflection. Demanding, complex and stressful situations discourage reflection because individuals must act quickly and simply do not have the time to reflect. Several skills and abilities have been identified as necessary to reflection including self-awareness, the ability to describe uncomfortable feelings, the ability to identify knowledge and challenge assumptions (critical analysis), the ability to integrate new learning, and the ability to judge the value of something (Atkins and Murphy, 1993). In addition to skill and ability, researchers have suggested other individual variables influencing reflection including age and experience. A level of maturity and willingness to reflect also make a difference (Sobral, 2000), but it is not the case that greater experience always leads to more frequent reflection. In fact, experienced physicians tend to use more non-analytical methods when dealing with usual cases (Norman and Brooks, 1997; Schmidt and Boshuizen, 1993). It is when they deal with unusual cases or face difficulties that reflection is prompted in order to reduce uncertainty (Mamede & Schmidt, 2005).

In addition to the benefits to clinical judgment, reflection also helps physicians relate to patients. Our ideas about how people should act in a given situation are societal and cultural constructions. Since we all have slightly different experiences and positions in society, our perceptions may be slightly or radically different from others (Kuper, Reeves, Albert, & Hodges, 2007). Physicians bring their own culture, beliefs, and expectations to patient

encounters. Students may assume *their* interpretation is universal unless they take the opportunity to reflect. And according to Epstein (1999), doctors gain the ability to observe patients while observing the self. I contend true personal reflection helps students to develop the skills and awareness to become more patient centered. In addition, reflection can benefit medicine itself by encouraging students to challenge existing theories (Kettle & Sellars, 1996). This questioning of traditional thought and ways of doing things promotes evolution within the field (Ferraro, 2000).

Because programs measure what they value, assessing reflection communicates its importance to students. Although “teaching to the test” has negative connotations, assessment can encourage development of reflective skills because students tend to focus attention on what they believe will be assessed (Becker et al., 1968; Fallows & Chandramohan, 2001). The process of preparing for assessment becomes the stimulus for learning. Current assessments of reflection vary in focus. Some focus on identifying types of reflection (Kember & Leung, 2000; Aukes, 2007) whereas others are more interested in judging the quality of evidence (Niemi, 1997). Some descriptions categorize reflection (Kember & Leung, 2000) while others are more developmental in nature (Fund, Court, & Kamarski, 2002). Lastly, assessments of reflection may be self-reported (Aukes, 2007; Sobral, 2000) or based on analysis of some form of evidence (Boenink et al., 2004; Mok et al., 2006, Stanton et al., 2007).

Many of these same authors highlight tensions related to the assessment of reflection. Some question whether students should be asked to reveal private thoughts particularly when there is lack of agreement about what is being assessed (Stewart & Richardson, 2000). Students also show varying levels of resistance in part fearing repercussions for truthful disclosure leading to superficial responses. Isaacson, Salas, Koch, and McKenzie (2008) found that guided writings are one way to provide a roadmap for a process that does not come naturally for some students.

Despite these concerns, most attention given to reflection in medical education has been directed toward implementing it into the curriculum with measurement of reflection garnering less interest (Kember & Leung, 2000; Aukes et al., 2007). This study provides a thick description of the use and assessment of reflection in one medical school. I examine two evaluation tools used by faculty to assess reflection in their medical students. I also analyze students' responses to guided reflection questions to ascertain the quality of reflection provided. Lastly I talk to faculty and administrators as they wrestle with questions of how to implement and assess reflection into the curriculum.

CHAPTER THREE

DATA COLLECTION AND RESEARCH METHODS

In this chapter, I address the conceptual framework supporting this study and research methodology flowing from the overarching research question of how the concept of reflection is used in the educational preparation of physicians. As a reminder, the following sub-questions help to answer the larger question:

1. How is reflection defined and evaluated in the first 2 years of the medical school curriculum?
    a. What are faculty and administrators beliefs and values related to reflection?
    b. What types of reflection are assessed: scientific, clinical, personal (Aukes, et al., 2007)? Why were these items chosen?
2. What is the relationship between faculty's perceptions of a student's reflective ability (as demonstrated in scores received on tutor evaluations) and the level of mindfulness (Epstein, 1999) demonstrated in their assigned reflections?

In this chapter, data collection, analysis, and quality are discussed. In addition, the context of the study is described including details about research participants as well as my position in regard to this research. Lastly ethical concerns and limitations are addressed.

Research Design

This is a qualitative single case study of the use of reflection in the education of students at one school of medicine. Although there are some

quantitative elements to the study, the numbers are used to aid in description and understanding rather than to attempt prediction. I use case study as a comprehensive strategy rather than a simple data collection technique. Because research methods should flow from the questions being asked, it is important to establish why a case study is an appropriate approach.

In order to be considered a case, there must be boundedness (Merriam, 2001; Stake, 1995). The case is a unit with some distinct limits. It is a “specific, complex, functioning thing” (Stake, 1995). According to Merriam (2001), if there is no ending or no limit to the number of people that could potentially be sought to gather information related to the target of the study, then it is not a case. Although the use of reflection touches many within the school of medicine, a limited number of students, faculty, and administrators can provide information regarding the use of reflection at this particular school. Although efforts are ongoing, the development of specific evaluation tools had a beginning with those involved being readily identifiable. According to both Stake’s and Merriam’s definitions, this effort is indeed a case.

The particular characteristics of research determine if it is well suited to a case study. According to Yin (2003), case studies are the preferred method (a) when research questions are “how” or “why,” (b) when studying naturally occurring events over which the researcher has little control, and (c) when studying contemporary events that can be directly observed or better understood through interviews and other documentation. Case study is a good fit for this research because this study focuses on *how* reflection is perceived and used in

the education of medical students, the effort being researched was not experimentally arranged in any way, and the effort is current and ongoing.

Case studies are not inherently qualitative or quantitative (Merriam, 2001; Yin, 2003), however, this study takes a substantively qualitative approach. Qualitative case studies are particularistic, descriptive, and heuristic (Merriam, 2001). The case itself is important for what it might reveal about a phenomenon and the thick description it provides helps readers discover meaning by extending their experience. A qualitative approach to this study is appropriate because the information sought can best be gained through rich descriptions of experiences and negotiated meanings and because understanding rather than predicting behavior is the focus. This study seeks to understand the process by which faculty and students use and make meaning of reflection and its place in professional practice.

Research Methodology

Tedlock (2005) talks about the observation of participation rather than participant observation as a shift from the attempt to objectively study the "other" to an approach recognizing the researcher's participation. Autoethnography emerged from this practice and combines "the autobiographical impulse (the gaze inward) with the ethnographic impulse (the gaze outward)" (Tedlock, 2005, p. 467). Berger (2001) explores the ways in which autoethnographic methods can foster rapport between the researcher and participants and the researcher and reader. She suggests that instead of maintaining strict boundaries between the researcher and researched, sharing personal information with participants

can enhance rather than handicap research. Sharing closes the hierarchical gap between the researcher and participant (Berger, 2001). The idea is to build a more collaborative understanding that includes a researcher's vulnerable self (Ellis, 1999) and that allows "readers to be more active participants in what they read and to witness the growing understanding between researcher and researched" (Berger, 2001, p. 508).

Ellis (1999) emphasizes the importance of concrete experience and creating a dialogue between participants and readers about human meaning. Her work takes what might be considered unconventional forms resembling a novel or conversation. Although my research is not an autoethnography, I approach data collection with a specific recognition of my own participation. This feels like an honest way to approach a situation in which I am not completely an insider nor am I completely an outsider. Although not involved in the initial development of the tutor evaluation or the reflection questions, I have influenced their later use in the curriculum. My familiarity meant I had knowledge that another researcher might not have and was able to provide certain details myself. At the same time, I was not present during the development of the tutor evaluation or reflection questions so I could ask those questions from an outside perspective. I concentrated my questions during the interviews to these unknown aspects and to the individual's personal understanding of reflection.

There are many decisions that must be made in designing a qualitative study. It is important to be aware that they need to be made (i.e., what is missed and what is gained by doing things one way but not another?) So in this chapter

and throughout my research efforts, I strove for awareness of these decisions as well as the associated implications.

Case Selection

Sometimes cases are chosen because the researcher wants to know more about that particular case. At other times, cases are chosen because they serve a purpose— they help us learn about something else. The first is known as an intrinsic case while the second is instrumental, and according to Stake (1995) this distinction is important because the methods employed for each are different. This case study is somewhat of a hybrid. It is based on an instrumental case because it was chosen in order to learn more about the multiple definitions and uses of reflection in the medical school curriculum, not because of interest in this particular school. But due to my employment position in program evaluation, I have an intrinsic interest in the efforts to use reflection as an educational tool. It is impossible to keep the two interests completely separate. Although it may be possible to choose cases based on their typifying particular circumstances, case study research is not sample research (Stake, 1995; Yin, 2003). It is important to determine “Of what is this a case?” however, case selection alone cannot answer this question. It must emerge during the study (Yin, 2003).

According to Stake (1995), the most important criterion for case selection is choosing the case that will maximize learning. Because the school studied has an extensive evaluation system in place there are many points of data related to reflection. Reflection is assessed by small group tutors throughout the first and second years of study. Students are also asked to complete written reflections on

their educational progress after their first and second years. Available data also made it possible to explore the relationship between tutor evaluations of reflection and the students' written reflections. In addition, my position allowed access to faculty that might not otherwise be available.

Selection of Student Reflections for Secondary Analysis

Extant student reflection data were selected from a medical class that had completed reflections in both their first and second years of study. A list of students was obtained with basic demographic characteristics including gender, age, and race but excluding name. Student reflections were purposively chosen to include a balance of men and women, ages, and race. Because the class is relatively homogeneous in terms of race and age, random sampling could have resulted in certain groups not being represented. I pulled all students who met race and age criteria (i.e., students older than 24, non-white) and then randomly sampled from those groups. I then figured out how many men and how many women were represented and did the same random selection to bring the numbers of men and women into sync. I chose 30 students because earlier analysis of reflection data showed that answers to reflection questions varied from student to student but were relatively similar on the whole. Therefore, I was not likely to gain additional information by analyzing additional reflections.

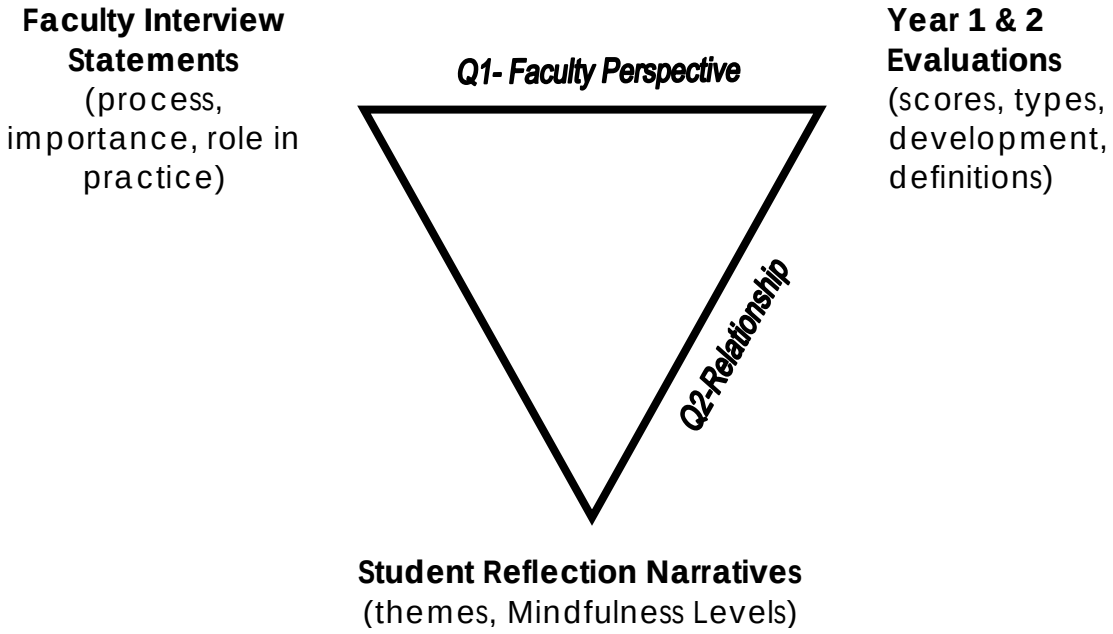
Data Collection Procedures

Reflection is an important part of a physician's professional practice. Therefore, many if not most medical schools have made some attempt to encourage reflection in their students through various curricular activities. Recall

from Chapter One, the faculty at this medical school developed eight key characteristics students should possess upon graduation. Students participate in problem based learning and an introduction to patient care in their first 2 years. Group tutors evaluate students on various elements of their performance including reflective ability and problem solving (See Appendix C). In addition, students are asked to reflect on their competence in the key characteristics and set learning goals at the end of their first and second years (See Appendix A). This is done in the form of guided reflection questions. Second year students also provide artifacts of their competence related to the eight key characteristics.

Data collection included a review of extant documents related to the development of the tutor evaluation, semi-structured interviews with first and second year faculty tutors and education deans (see Appendix D for guiding questions), and extant data related to tutor evaluations and student reflections. Collection procedures flow from the research questions. Table 1 outlines the relationship of these procedures to the question, artifacts of the collection process, and related analysis methods discussed in the next section. Figure 2 depicts the research design.

Figure 2: Research Design Diagram



Faculty perspectives were explored by completing interviews which explored evaluation process questions and the importance of reflection and its role in practice. Because they were developed by faculty, the first and second year evaluations were also analyzed as an artifact of faculty thinking. The Year 1 & 2 evaluations were also analyzed for type of reflection as well as patterns of usage. Lastly, students' reflection narratives were analyzed for theme and mindfulness level and compared to Year 1 & 2 evaluations. A detailed accounting of the order of analysis can be found in Appendix E.

Faculty Perspectives on Reflection.

Current Year One and Year Two tutor evaluations were analyzed as artifacts of faculty thinking around the concept of reflection. Copies of the evaluation were provided by the school along with reports summarizing two years

of data for all students by all tutors. In addition, I conducted semi-structured interviews with three faculty and two education deans who participated in the committee that developed the tutor evaluation. Several faculty involved in the development have since left the university. In addition, two faculty tutors who are current curriculum leaders were interviewed. These interviews focused on faculty perceptions about the relationship between reflection and practice and reflection's place in the curriculum. Because the study uses existing data, faculty interviewees were asked to comment on their evaluative practices related to this tool in order to provide further process description. In addition to the above content, interviews with the deans of curriculum and evaluation also explored the context of the development and use of evaluation tools. Because the research questions focus on the use of reflection at an organizational level, it was important to understand the evaluation process and discussion around tools designed to measure these skills in students.

Holding multiple interviews with participants can be used to build rapport and provides opportunity to identify any idiosyncrasies that might not be recognized in a single interview. Given that I have a preexisting relationship with interviewees and am primarily focusing on the development of the evaluation tools and perceptions of the organizational culture around reflection, multiple interviews were not necessary. In addition, interviewees have very busy schedules so requiring multiple interviews would likely have lead some faculty to decline participation. I did short informal follow-up interviews as needed for clarification. Interviews were audio-taped for transcription and analysis. A digital

recorder was used and interviews transcribed by a volunteer transcriptionist who signed a confidentiality agreement. I checked all interviews for accuracy myself before any analysis was completed.

Faculty Perceptions of Student Ability to Reflect.

The school provided Access reports of class performance on tutor evaluations for participants' first 2 years of medical school. This document was stored both electronically and as a printed document. Individual reports of student performance on tutor evaluations for their first 2 years of medical school were de-identified by assigning a research number so that names were never associated with student data. This procedure was completed by school staff, therefore identities were unknown to the researcher. The research numbers and student information were kept in separate locations and in a drawer in my locked office.

Student Reflections.

The school provided for secondary data analysis another document containing de-identified reflection narratives completed at the end of their first and second years of study. This document was stored electronically. Data was de-identified by assigning a research number so that names were never associated with student data. This procedure was completed by a medical school staff member, making the identities unknown to the researcher. The research numbers and student information were kept in separate locations and in a drawer in my locked office.

Table 1: Relationship of Research Questions to Methods

QUESTION	DATA COLLECTION METHOD	DATA COLLECTION ARTIFACTS	ANALYSIS METHOD
1. How is reflection defined and evaluated in the first 2 years of the medical school curriculum?	Semi-structured Interviews with Faculty	Transcripts	Explore emerging themes and patterns
c. What are faculty beliefs and values related to reflection?	Gather Artifacts- YEAR ONE & YEAR TWO Tutor Evaluations	Description of evaluation Memo of item coding	Document Analysis- Code for reflection type
d. What types of reflection are measured: scientific, clinical, personal (Aukes, 2007)?	Semi-Structured Interviews with Education Deans	Transcripts	Direct Interpretation, Content Analysis
2. What is the relationship between faculty's perceptions of a student's reflective ability (as demonstrated in scores received on tutor evaluations) and the level of mindfulness (Epstein, 1999) demonstrated in their assigned reflections?	Extant Data: Scores on tutor evaluations of reflection Reflection Narratives	Data Set Student Narratives Memos	Code each narrative using Epstein's level of mindfulness Explore emerging themes and patterns

Data Analysis

Hatch (2002) asserts, "analysis is the most mysterious and difficult part of qualitative research" (p. 54). This section is designed to demystify my intentions related to analysis of collected data. As mentioned above, data collection and data analysis should flow from the research questions. Table 1 outlines the

relationship of the analysis to the research questions and methods of data collection.

Quantitative research is concerned with how the information about a studied sample applies to a larger population. For case studies, however, particularization rather than generalization is important. The focus is not on how the case is different than another but rather the “emphasis is on uniqueness, and that implies knowledge of others that the case is different from, but the first emphasis is on understanding the case itself” (Stake, 1995, p.8). So analysis focuses on the particulars of the use of reflection at this school of medicine.

Because qualitative research usually generates such a large volume of data, I made a plan for organization prior to data collection. LeCompte (2000) compares analyzing qualitative data to putting a puzzle together. Because the puzzle is difficult to assemble if the pieces are warped or missing, she suggests taking care in collection and analysis of data. Analysis can become warped if data is missing or out of place due to lack of organization. LeCompte provides a five-step process to analyzing data, which I used as an overall approach to organizing my analysis. The plan is summarized below:

Step One: Organize, categorize, and file all data
Step Two: Look for “items” of interest in the data by frequency, omission, declaration
Step Three: Put similar items together
Step Four: Look for patterns that might explain events
Step Five: Assemble patterns into structures to help describe/explain the entire phenomenon

Traditionally content analysis has been associated with the quantitative treatment of text. However, Hsieh and Shannon (2005) contend that the term content analysis forms a large umbrella under which a variety of approaches to understanding text data can fall including qualitative uses that go beyond counting words. Qualitative content analysis encompasses in depth classification to create categories of text that hold similar meanings. For Hsieh and Shannon (2005), “qualitative content analysis is defined as a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (p. 1278). These authors describe three types of qualitative content analysis, two of which I use in this study. The first, summative content analysis relies upon the identification and counting of key words followed by the subsequent analysis of the context of the communication. I do not use this type of content analysis in this study, but do rely upon what they term conventional and direct content analysis.

Using conventional qualitative content analysis, codes are derived by identifying key words that seem to represent important thoughts or concepts. An iterative process of memo writing and returning to the data enables the development of meaning for the codes and for understanding the relationships among them. The primary drawback of this approach is the potential for missed categories if the researcher fails to adequately understand the context of his or her study. Specifically, I used the conventional approach to analyze the faculty interviews and student reflection narratives.

Directed content analysis entails the use of prior theories and research about the topics of study. Although inquiry remains open ended (in the spirit of qualitative research) some targeted questions gleaned from the literature may be used. This direct approach was used for analyzing the tutor evaluation items using Aukes et al. (2007) types of reflection and for the secondary analysis of the student reflection narratives using Epstein (1999) Levels of Mindfulness.

Interviews

Semi-structured interviews helped answer question 1a related to faculty perspectives on the use of reflection in medicine. By coding and looking for themes and letting meaning emerge through participants' words, I produced a content analysis of interview transcripts using constant comparison (Glaser & Strauss, 1967). While it is impossible for researchers to approach a study as a blank slate, I do think it is important to let the data tell the story. Sorting data into categories could obscure experiences, and there is the danger of creating neat boxes that really do not match experience; but I do not think this is an inevitable byproduct of the method. Although the aim of this study is not to produce grounded theory, the constant comparative method is used to identify emerging themes in interview responses and student reflections. I emphasized interpretive understanding of participants' meaning rather than looking for universal truth.

Analysis of individual interviews started immediately after completion of each interview. Direct interpretation of the interview was recorded in a reflexive journal that recorded personal reactions, content, and methodological questions that arose. Interviews were transcribed and coded for emerging themes. I

checked my interpretations by writing memos for each interview and presenting them to interview participants. Adjustments were made as needed.

Tutor Evaluations

Evaluation tools were analyzed as an artifact of faculty thinking about the place of reflection in the education and practice of future physicians. The tutor evaluation items were categorized using Aukes et al.'s (2007) description of types of reflection in medicine: Scientific, Clinical, and Personal (Research Question 1b). Interviews with education deans provided context to the development and use of the tutor evaluation. Student performance on the self reflection section was assigned a number so they could be more easily compared.

Item reflection type. Coding of Reflection Type for the tutor evaluations was completed by a second coder with a Ph.D. in Information Sciences and Learning Technology and a background in medical education. Secondary coding was completed on the Superior level of each section resulting in coding for 48 of the 151 (32%) items that make up the evaluation. Most but not all items have a corresponding descriptor in the Unsatisfactory and Satisfactory Levels. Professionalism was the only section in which the Satisfactory level was secondarily coded. Satisfactory is the highest level achievable in the Professionalism Section which also includes Marginal and Unsatisfactory levels.

Two rounds of secondary coding were completed resulting in overall coding agreement of 84.4%. In the first round, 25 items were coded in the first three sections of the evaluation: Participation in Class, Problem Solving, and

Group Interaction in Learning. Minor updates to the coding definitions were made based on feedback from the secondary coder. This included the addition of a definition of General Reflection, which was not one of the types outlined by Aukes et al. (2007). However in coding the items, there were some that seemed to cut across all types of reflection and these were coded as “General” reflection. The second round included items in the remaining sections including Integration and Synthesis, Critical Thinking, Sources, Self Reflection, Self-Directed Learning, and Professionalism.

Because more than one type of reflection could be assigned to each item, a method of calculating partial agreement had to be devised. Simply asking whether coders completely agreed gave more weight to disagreement than to agreement particularly if coders chose more than one type of reflection. So agreement was calculated based on the decision to include or exclude each reflection type for each item. There are four decision points for each item: Does this item assess (a) personal reflection, (b) scientific reflection, (c) clinical reasoning, (d) general reflection? So both exclusion and inclusion were counted as agreement.

Individual performance comparison. These evaluations are arranged by major sections of performance for the first 2 years. Each section has lists of descriptors organized by performance level: Unsatisfactory, Satisfactory, and Superior. Each section also contains an “Overall” rating of student performance. For the purpose of this study, the section titled “Self Reflection” was analyzed for each student participant.

The design of the tutor evaluation allows faculty to give students an overall rating of Unsatisfactory, Satisfactory, or Superior but also mark behavioral descriptors at either of the other levels. For example, a student may receive an overall **Satisfactory** for the Self Reflection section, but have one check in the **Unsatisfactory** area indicating an area that needs improvement. This allows faculty to provide feedback without having to type out comments. In order to account for these variations, I developed the system outlined below. In general, if a student received a check for an item below the overall rating (a secondary rating), they received a lower score. If the student received a secondary rating for an item higher than the overall rating, he/she received a higher score. The following ordered ranking will be applied:

Overall	With a Secondary of. . .	Points
Unsatisfactory	None	1.0
Unsatisfactory	Satisfactory	1.1
Unsatisfactory	Superior	1.2
Unsatisfactory	Satisfactory & Superior	1.3
Satisfactory	Unsatisfactory	2.0
Satisfactory	Unsatisfactory & Superior	2.1
Satisfactory	None	2.2
Satisfactory	Superior	2.3
Superior	Unsatisfactory	3.0
Superior	Unsatisfactory & Satisfactory	3.1
Superior	Satisfactory	3.2
Superior	None	3.3

Student Reflection Narratives

Existing student reflective narratives from students' first 2 years of study were analyzed by assigning a level for each question as well as an overall rating based on Epstein's (1999) Levels of Mindfulness:

0) Denial & Externalization—Sees the problem as "out there". May avoid responsibility or reflection.

1) Imitation/Behavioral Modeling-- Takes some responsibility, uses external behavioral standard to resolve situation.

2) Curiosity/Cognitive Understanding—Makes decisions based on cognitive models. Reflects to generate hypotheses but ignores personal knowledge, tacit knowledge, and emotions.

3) Curiosity/Emotions & Attitudes—Shows curiosity about feelings, thoughts, and behaviors without labeling them as good or bad.

4) Insight—Shows three facets of understanding including the nature of the problem, how to attempt to solve, interconnectedness of practitioner and knowledge.

5) Generalization/Incorporation and Presence-- Uses insight to generalize. Incorporates new behaviors and attitudes, shows compassion.

The following basic procedure was followed for coding reflections: (a) rate each question, (b) write a justification for each question, (c) reread all justifications, (d) give an overall level, and (e) write a short justification for the Overall Rating. More detailed descriptors of levels were developed. I started by creating descriptive bullets of the levels taken directly from Epstein's article. I used five reflection responses of students not part of the formal study. The first two were used to augment the original descriptions by attempting to assign each question a level. Using the augmented descriptions, the remaining non-study

reflections were coded by myself and a second coder. This secondary coder has a PhD and works in higher education as an institutional researcher. For non-study reflection 2, the secondary coder and I coded one question, then discussed our decisions and made additions to the descriptors until all questions were done. For non-study reflections 3 and 4 we coded all questions then discussed each individually. Afterward, I took the notes from non-study reflection narratives 2-4 and updated the coding schemes including example statements. After providing the new scheme to the second coder, non-study reflection 5 was coded and discussed. Final revisions to the code descriptions were made based on these discussions.

Next, I provided a third coder with the updated coding scheme. This coder is an educational leadership Ph.D. candidate with ten years of experience in continuing medical education. We met in person, and after an explanation of the project, Coder 3 coded all questions for non-study reflections 2, 3 and some questions for non-study reflections 4 and 5. We discussed any coding disagreement. A few suggestions regarding the descriptors were made by the third coder, so again the coding scheme was updated based on her suggestions. Next, Coder 3 was given ten Year One reflections. This constitutes more than 15% of all study reflections. Secondary coder and researcher coded independently and met to discuss any discrepancies. After discussion, our final agreement was 98.3% (59 of 60 questions and overall ratings).

In addition to coding for mindfulness level, a content analysis of these narratives was completed to discover any emerging themes. This was done for

each year and both years compared. I used the compare and merge function in Microsoft Word to put the Year One and Year Two reflections together in one document that indicated by underline what was added in Year Two and noted what words were deleted from Year One. I then noted changes from Year One to Year Two and wrote a memo. I did a word count to determine what percentage of the Year Two entries were copied from Year One. Lastly, a correlation between the faculty rating of reflective ability and the level of mindfulness was calculated.

Data Quality

There is disagreement on the usefulness of the terms validity and reliability in relation to qualitative research. Lincoln and Guba (1985) believe the conventional standards of internal and external validity, reliability, and objectivity are inappropriate for naturalistic inquiry and according to LeCompte (2000), the way to know whether an analysis is valid is “whether or not research findings seem accurate or reasonable to the people studied” (p. 152). Under this definition of validity, results are only credible and useful if they are meaningful to participants. Regardless of the terms used, most agree that demonstrating credibility of studies is important (Creswell & Miller, 2000).

According to Creswell and Miller (2000) validity depends upon whether it is being considered by researcher, participants or outsiders. It is important to consider validity from all three perspectives. For this study, I have included data quality methods from all three lenses. I have chosen to use the terminology advocated by Lincoln and Guba (1985) to describe data quality issues:

trustworthiness as composed of credibility, transferability, dependability, and confirmability.

Provisions for trustworthiness have been built into the research design. These include:

1. Triangulation: Multiple methods of data collection were used including document analysis, extant data analysis, and individual interviews. In addition, information was gathered from several sources including Year One and Year Two faculty, clinical faculty, administrators, student reflections, and tutor evaluations. Using multiple sources enhances credibility by putting comments into context and providing more opportunity to check inconsistencies (Seidman, 2006).
2. Member Checking: Interpretation of interviews and evaluation content was checked with participants by providing a memo containing interpretation of the interview and representative quotes used in findings chapters.
3. Peer Debriefer: A fellow researcher served as a peer debriefer.
4. Reflexive Journal: The researcher maintained a reflexive journal, which recorded the research process and was available for review by the researcher's doctoral committee chair.
5. Negative occurrences were analyzed for meaning in relation to other sources.
6. Audit Trail: I documented the process and product of research through making memos and journaling (Creswell & Miller, 2000). The audit trail covered all research activities related to data collection and analysis

including the criteria and processes used for reducing data, memo for each category and theme identified, and a detailed accounting of decisions made. Table 2 outlines procedures designed to increase the trustworthiness of the proposed research.

Table 2: Provisions for Establishing Trustworthiness

Standard	Processes for achieving
Credibility Showing that multiple constructions have been adequately represented	• Information triangulated through multiple data collection methods (document analysis, interview) with multiple sources (faculty, administrators, student performance) • Negative occurrences not ignored. Instead, they were analyzed for meaning in relation to other sources • Member checking- provided summary of interpretation for each interview • The researcher maintained a reflexive journal
Transferability Making known the degree of similarity between sending and receiving contexts.	• The researcher strives to provide descriptions adequate enough to determine whether the receiving context is similar enough to warrant transferability • Reflexive Journal
Dependability Factors related to instability and design induced change.	• Triangulation of data (see above) • Reflexive journal
Confirmability Focuses on data.	• Audit trail • Triangulation (see above) • Reflexive Journal

Rather than the three rigid views suggested by triangulation, Richardson (2000) suggests qualitative materials should “crystallize”. Reflected “externalities

refract within themselves, creating different colors, patterns, arrays, casting off in different directions. What we see depends upon our angle of vision" (Richardson & Lockridge, 2004, p. 240). In crystallization, the story is told from different viewpoints: "There is no one 'correct' telling of (the) event. Each telling, like light hitting a crystal reflects a different perspective" (Denzin & Lincoln, 2005, p. 6). I made every effort to recognize and represent the multiple facets of this story.

Context of Research Site

In this section I discuss characteristics of the research participants. I also provide background information about myself which is relevant to this research.

Participants

There were seven interview participants with overlapping roles. Six were faculty tutors active in the first and second year curriculum and three were Deans of Education (Evaluation, Curriculum, and Student Affairs) for this medical school. Those interviewed were a mix of medical doctors, basic scientists, and educators. A secondary analysis of tutor evaluations and student reflection answers from the first 2 years of study was completed for thirty students in the same entering class.

Researcher Positionality

Research has autobiographical roots that should be identified (Seidman, 2006). Researchers come to a topic for a reason. Interest keeps us energized, but it is important to reveal these roots in order to minimize any distortions. In choosing a research topic, it is important to be passionate because this helps maintain motivation, however, too much emotional attachment can bias your data

collection and analysis (Glesne, 1999). Qualitative researchers must be clear with the reader and themselves about researcher position— how the researcher helps to create and become a part of what is studied. Different backgrounds influence a researcher's focus; therefore, it is important to share aspects of my background that influence my focus in approaching this study.

I am currently an Instructional Design Specialist working in medical education and a PhD student in Higher Educational Leadership. My educational background is in rehabilitation counseling, and I worked in social services for ten years. A person-centered approach was a value of the rehabilitation profession and mental health field in which I worked. I do believe that respecting patients' perspectives and providing information so that individuals can make informed choices is the "right" way to practice and expect that reflection is an important component to patient centered medical care. I was however open to whatever themes emerged from the data. I have dealt with the issue of bias by using others in debriefing and to review my research journals. These strategies are outlined in more detail in earlier sections.

Some warn against studying people and phenomena with which the researcher has prior relations (Hatch, 2002), but England (1994) says fieldwork is always personal. And others feel that these prior relationships add dimension: "Inside researchers explicitly study not just others but also ourselves, attempting to gain insight through everyday life truly lived along with the rest of the community" (DeLyser, 2001, p. 446). For this study, I am both an insider and an outsider. I currently work for the school of medicine in the areas of student and

program evaluation. The discussions and decisions around key characteristics of graduates as well as the development of the evaluation tools studied were all completed prior to my employment at the school, so I am clearly an outsider when it comes to the main focus of the research. In my position, however, I provide input into the evaluation of student reflections and to revisions of current evaluation tools. In addition, I interact with some of the Deans of Education through the normal course of work. For example, some faculty also grade for the Year One and 2 exams that I help coordinate. Others participate in work groups developing evaluation content for the third year of medical school. Another key informant is my supervisor. Although these relationships had the potential to provide complications, they ultimately allowed me an unusual level of access to participants.

Overlapping roles can, however, cause strain and may necessitate working through interpersonal tensions (DeLyser, 2001). As part of my data analysis, I used a personal journal describing my observations and experiences related to the use of reflection in the curriculum. The interpretations and my experiences were shared with participants. This involves having to give up a certain amount of “safety” by revealing my own thoughts and feelings on issues, (Berger, 2001). Instead of hiding behind the role of researcher, relationships must be continually negotiated. Another concern is in knowing how much to reveal particularly around disagreements between participants, researcher disagreement on issues, and about researcher dislikes (Berger, 2001). These are all excellent considerations. I have been concerned about some of these issues

myself. I strove to address these concerns by being as honest about myself as possible including any information that might reflect badly.

There is also the issue of dealing with any negatives that may come up while collecting data for this study. Because I will have continuing relationships with the participants once research has been concluded, I needed to be sensitive; but I have been committed to making my interpretations and bringing them back to participants for member checks. It is important to understand how I am viewed by informants when doing this kind of insider research. I attempted to "identify and understand my own complicity in constructing particular versions of the past and of the present" (DeLyser, 2001, p. 450). This was simultaneously both difficult and fascinating.

In addition to the bias the researcher brings to this situation, sometimes informants' assumptions can get in the way (DeLyser, 2001). When prior relationships exist, informants may assume the researcher already knows the answer to questions by virtue of the researcher's role in the community. Participants may become annoyed because taken for granted assumptions are questioned. I anticipated less of a problem in this regard because my position is somewhere between insider and outsider. I was not present during the development stages of the evaluation tools, so no one assumed I knew the details of the history.

Ethical Concerns

No serious risk to participants was anticipated. Due to the nature of the topics discussed (particularly in relation to student performance, or faculty

perceptions related to reflection), participants could suffer negative consequences if particular comments were directly attributed. Names and places have been changed in order to protect participants' identity in all reports. This information was shared (even with doctoral committee members) on a need to know basis and information will not be shared outside of the research team without written consent. Therefore, participants' identities will be protected. Lists of pseudonyms and participant names was kept in a drawer in my locked office and will be destroyed five years after data analysis concludes.

In order to minimize any inconvenience, the interview and member checks were done at times and locations chosen by the participant. Individuals were informed that participation was voluntary and could be terminated at any time. They were also told they could decline answering any or all interview questions without explanation and could end the interview at any time. This did not occur during any of the interviews.

Evaluation activities related to student reflections are already IRB approved. IRB approval for this project was obtained. All provisions of human subjects guidelines were followed. Terms of participation were made clear and waiver of documentation of written consent provided to interview participants (Appendix F).

Limitations

Because case study research uses the researcher as the primary instrument for data collection and analysis, these activities are limited by my knowledge, past experiences, skills, and potential biases (Merriam, 2001). I

strove to be aware of gaps in my knowledge or skills and seek assistance and additional information as needed.

Because of my position within the larger organization, I did not need significant time in the field orienting myself to the context and establishing relationships with the participants. Although there were definite advantages including access, there is also the potential that participants' openness was limited because they may have concern that information would be shared within the organization. I assured participants that comments would not be directly attributed in the write up.

Given the work schedules and responsibilities of participants, the decision was made to limit interviews to one unless follow-up was needed. Multiple interviews would have helped to establish the trustworthiness of the information gathered. Faculty could be hesitant to discuss any negative aspects of the curriculum or the use of reflection. It was important to thoroughly describe the purpose of the research and establish a relationship with participants.

In addition, one aspect of this research may be considered both an asset and a limitation. The evaluation data used in this study pre-dates this research. Therefore there was no opportunity to validate the items or do cross rater reliabilities. This is important to the overall goal which involves exploring the use of reflection as it naturally developed, however this means that assessment items and student ratings reflect individual faculty perspectives rather than a standard definition of reflection.

To explore the meaning and assessment of reflection in the professional preparation of physicians I analyzed the content of individual interviews with tutors and administrators, reviewed existing evaluations used in the pre-clerkship year, and analyzed student responses to questions designed to encourage reflection. The goal is to produce a thick description of the use of reflection at this medical school. At this medical school, evaluations are referred to as “tools.” That convention will be used in the following discussion. Chapters 4 addresses Faculty Perceptions, Chapter 5 addresses Tutor Evaluations, and Chapter 6 addresses Reflection Questions and the Relationships between Tutor Evaluations and Reflection Questions.

CHAPTER FOUR

FINDINGS: FACULTY PERCEPTIONS

In this chapter, I describe the ways in which the faculty interviewed defines reflection and its use in medical education. Information from those interviewed about the tutor evaluation and reflection questions development and use can be found in those sections. Seven school of medicine faculty and administrators were interviewed. Interviewees were a mix of basic scientist and clinicians. All available developers of the tutor evaluation were interviewed. Most interviewees were experienced tutors. The following is a brief biographical description of interview participants:

> Dr. Ward Bartels is a basic scientist. He has taught in medical schools for 30 years. He has been a professor at this school for more than 20 years. He has become more involved in teaching medical students in the last 15 years. He is a curriculum leader and has tutored all first year blocks for almost ten years.
>
> Dr. John Liberty is a basic scientist. He has a PhD and has been a faculty member at this institution for almost forty years. He always gave lectures but has been very involved in medical education since the curriculum switched to problem based learning. He is a curriculum leader and has tutored problem based learning for the past fifteen years.
>
> Dr. Glenn Hobbes is an MD. Over ten years ago, she left private practice for her job at this university. She is a leader in the clinical curriculum. She also writes and reviews PBL cases and grades problem solving exams for the first and second year. She has tutored PBL six of the last ten years and has tutored patient care small groups.
>
> Dr. Tara Cuttingham is an MD. She went to medical school and completed training in another country. She has been in private practice in the past, but always worked in places where training occurred. About five years ago, she took an administrative position in student affairs with this university. She has tutored in patient care small groups but does not do this on a regular basis.
>
> Dr. Kevin Brooks is an administrator in medical education. He has a PhD in education and has taught at the college level for his entire career. He

has held a leadership position at this institution for more than fifteen years and was instrumental in transitioning from a traditional to a PBL curriculum. He has tutored at least two PBL blocks a year for fifteen years.

Dr. Dale Miryck is a basic scientist. He has been a faculty member at this institution for almost twenty-five years. He was involved in the development of the current PBL curriculum. He is a curriculum leader and has tutored multiple blocks per year for the past fifteen years.

Dr. Carol Farmer is an administrator in medical education. She has a PhD in education and has held a leadership position at this institution for the past seven years. She has a background in clinical management and education, program evaluation, and process improvement.

Although I noted overlap in the ways interviewees define reflection, each person had an overarching focus and unique way of looking at reflection. Dr. Cuttingham emphasizes the role reflection plays in helping students build a professional identity. Dr. Liberty equates reflection with understanding roles and figuring out how one fits in. Dr. Bartels focuses on reflection as thinking about thinking—trying to figure out how one knows what they know. This is similar to Dr. Brooks's view which defines reflection as answering the question "why" and seeking information. Dr. Myrick defines reflection as monitoring performance and using feedback to make improvements. Making improvements is also emphasized by Dr. Brooks, but making meaning is also an important focus for him. Dr. Farmer emphasizes the self motivation to reflect. For her, reflection is not only about responding to someone else—there is also a "soul searching" aspect that originates from within. She also discusses the ways that students use reflection on personal experiences to understand another person. Dr. Hobbes has a broad perspective on reflection discussing roles and responding to feedback but also about medical decision-making and professional identity. Almost all interviewees say that students have to tell you that they want to make

some change in order to know they are reflecting, but Dr. Miryck and Bartels are particularly concerned with the subjective nature of reflection. The next three sections address common themes related to definitions of reflection, the phases of reflection discussed, and the types of reflection discussed.

Common Themes

Purpose of Reflection

Several faculty mentioned the benefits or purpose of reflection. Some emphasize more immediate benefits like fitting in with the PBL group while others discuss longer term implications such as increased likelihood of delivering patient centered care or becoming a functioning physician. Dr. Liberty emphasizes the role reflection plays in helping students to fit in, work together, and understanding the bigger picture:

> I think reflection, the way I've heard it used, is sort of an individual's ability to . . . look at the big picture and see where they're fitting in and reflecting on their role in that big picture. See, in medical, problem-based learning students have to . . reflect on what their role is really supposed to be in problem based learning. And how they reflect on how they're supposed to interact with the other students and to what extent they interact with faculty as opposed to other students (L2).

When asked about reflection, Dr. Hobbes thought having so much practice with medical problem solving in the first 2 years gives students more confidence in their abilities to work with patients. Drs. Brooks and Miryck emphasize that reflection involves improvement:

> I think once I try and give it meaning, which is basically the kind of the constructivist approach to things then I'm really getting into reflection. When I use my experiences and my observations particularly my self observations to develop a personal quality, it becomes an improvement activity. In other words, ok "I just listened to the heart, and then I think did I do a very good job? I didn't hear it as well as I think I should have because

> I didn't put the stethoscope where I think I should have put it," that's the reflection which causes people to improve (K11).
>
> That they are aware and monitor their own work, the quality of their work, thoroughness, various qualities I think. And then are interested in improving and getting feedback and then implementing changes that you can see that you could document in their performances over the areas in PBL (M5).

For Dr. Farmer, reflection helps physicians to know their boundaries and be thoughtful in planning next steps. Reflection is part of meeting professional responsibility for continual growth:

> The ability to know your boundaries, things that you're good at and the things that you need to work on. It's the ability to say you know I'm living my life or I'm doing my practice or I'm organizing my professional life in a way that is consistent with my values. And I think that it's particularly important for our medical students. Because at the end of the day they need to know what their personal values are and they probably don't quite yet. It is knowing being thoughtful about where the next step is so that I don't just finish medical school . . .and say "Ok. That's it I'm done". That professional responsibility for continual growth not only professionally but personally (F45).

Both Dr. Cuttingham and Dr. Farmer discuss the role reflection plays in organizing one's professional life. Reflection helps the student and later physician know that the way he/she responds in their professional life is consistent with their personal values.

> They're going to be put in positions where they're going to have to make difficult decisions either about withdrawing care, end of life care, or abortion, teenage pregnancies. I think they need to be very aware about what they feel personally and have a mental conversation with themselves about what they feel is appropriate professionally and those two may not be the same thing (F48).

Self reflection helps the physician manage how he or she relates to the world and the content of medicine and helps professionals organize their life and practice in a conscious way rather than simply taking things as they come:

> So there's all of that about how you organize your professional life, how you organize your office, how you organize where you live, what you do, what you do with your personal phone number, how do you know when people are going to call you, would you have them in your house? What if you meet them at a neighbor's or at a wedding? Or, how you're going to handle those things? And so there's all of that kind of thing. And then there's how you think about it (C15).

Reflection also helps physicians manage emotions and protect him or herself from giving too much:

> So I can be involved and I can be involved enough, I can be available, I can be available enough. I can be empathetic and then I can leave and forget about it and just go home. . . . you have to be able to keep thinking when you are very emotionally stirred up. And if you don't have a self reflection piece, you're not even aware that you're emotionally stirred up and (of) how it's affecting your thinking processes. You have to be able to keep thinking, keep functioning, keep being available, keep being empathetic, keep being patient, tolerant, be calm, be understanding, absorb an awful lot of emotion and then go away and leave it. So you have to be absolutely ruthless (C19).

Thinking about boundaries ahead of time allows the physician to put patient interactions in their place and helps the physician keep thinking when experiencing difficult emotions, allows the person to look at the ways their emotions may be influencing their thinking.

Motivation to Reflect

All of those interviewed discussed what prompts student physicians to reflect. The MDs interviewed also discussed things that prompt reflection in their

own practice. Students get information from many sources and have to decide on a moment by moment basis how to adjust their own behavior:

> They have to figure out graceful ways to communicate with patients that still show some empathy, and sympathy, and compassion and understanding. So I guess I could say it doesn't really matter if it's the patient or other people on the team whether they're doctors or nurses. It happens a lot on the wards and the clinics when they have to pick out all the feedback and cues they're getting on a moment by moment basis. In fact the second year student that I had in clinic yesterday picked up on a lot of nonverbal cues on a patient of mine, a brand new patient of mine who seemed very defensive to me (H16).

Dr. Brooks stated that students begin reflecting when they realize they cannot simply memorize all of the information they need. They must make meaning: "the medical students who are getting this huge amount of information being thrown at them and they have to make sense out of it. Which is I think is the basis to constructivist learning. That I think is the beginning of reflection for the students. Once they find that they cannot digest all of this information without making meaning for themselves" (K28). Dr. Liberty also notices that the PBL process itself encourages students to reflect because it is a way of learning most have never experienced:

> Being dependent on their fellow students to get correct information and to get the necessary information for an exam. I think there's a fair amount of trepidation on their part. I think that in turn causes them to reflect about the roles that they're playing. How to best do them; they observe their classmates and how they're doing them. And that type of thing trying to accommodate how they fit in (L5).

Dr. Miryck believes students reflect in order to pass exams, but in his experience this is a lower level motivation. Instead most students want to learn because they are concerned for future patients and want to carry their weight with peers. They are also prompted to reflect by comparing their own characteristics to those of a

“good doctor.” Dr. Farmer thought becoming personally connected with patients makes reflection more likely:

> I think there is a subpopulation that becomes more reflective across time. I’m not sure that the general class is that way. And I think that a lot of it depends on how personally connected they get with the patients that they see. And that can be because you know their brother had something that was the same. It can be that they recognize their own struggles in different patients. It can be because they had an excellent mentor (F45).

Dr. Hobbes discussed being a new physician and all of motivations to reflect including developing your own reputation, not having someone else ultimately responsible, and figuring out what you don’t know. In addition, there is a new level of responsibility when dealing with families that prompts new physicians to reflect:

> So when you’re a brand new doctor, that’s a new role so you have to reflect back on other people you’ve interacted with and are role modeling again. Because again I remember thinking I want to be like Dr. Peterson in this instance or I want to be a little more authoritarian like I saw Dr. Sanchez do. And so I relied a lot on my teachers, much more so than, I relied more on my teachers from my residency (H16).

In this situation, Dr. Hobbes discusses reflecting back to how she saw physicians interact with families and trying on these ways of being. There does, however, seem to be an interest component to reflection as well. Students have the potential to become more reflective, but Dr. Cuttingham estimates that in each class 20-30% of all students are not at all interested in reflecting on their personal and professional identity (C24).

Dr. Bartels and Dr. Cuttingham address the way that practice becomes automatic after some time but that crisis or something unusual prompts

reflection. Something has gone wrong, there's a wrong diagnosis, something is life-threatening:

> This one I have to think about and what you have to think is that the model doesn't fit or there's something else going on, or that's when the reflection becomes part of clinical practice. I think surgeons do it, you know a lot of the time it's like- I've taken out 10 appendixes, "Oh this one is going wrong." You know it's kind of stepping back and it's not automatic anymore. I think what people call reflective practice that it's sort of like you're on autopilot a lot and all of a sudden-- well okay, now I'm not. I think that physicians have to do that. I think other people have to do that too and sometimes it's because something has gone wrong technically, sometimes it's the wrong diagnosis, sometimes it's because you, because something else is happening, it's become life threatening, this one's going to die, or this one's really dangerous and then instead of doing the automatic thing I have to address the relationship in a different way (C29).

Dr. Bartels also talks about how simple formulas are not enough to practice medicine. Awareness of thought processes is important for those times that things are unusual:

> Unless they are actually trying to connect all of these things through basic science and say "Yes this does make sense" instead of just using this blind formula that so many of them use now a days. Then they're not thinking about what they are doing. And I want them to think about what the process is. How they are making a diagnosis. I think that is really critical. If they don't make the right diagnosis, you're not going to get well. Now 90% of the time, probably 95% of the time it's not going to make any difference really because the algorithms they use are good enough that their going to cover 95-99% of the people that walk in the door. But there are going to be a few strange cases where they actually need to think (B14).

Time and mental space came up for three of the seven interviewees. Dr. Brooks thought de-emphasizing exams would decrease anxiety and may provide students more "room" for reflecting on their learning rather than simply memorizing. Dr. Cuttingham says more time is needed to contemplate unusual

cases. Dr. Farmer thought time away from an event or circumstance was necessary for reflection to occur but that medical education does not provide enough time for this “cold action”:

> I think that going to medical school here is kind of like drinking from a fire hose. And their entire life is consumed with passing exams. And I think part of the reason that it works better at the end of the first year than it does at the end of the second year is because at the end of the first year the students sit back and say “Wow! I made through a year of medical school, good for me.” They take a deep breath and think about what they want to do next year and they’ve got some time and space. They don’t have that at the end of the second year. They’re worried about Boards and they’re scared to death to start on their clinical rotations. And so not only are they more cynical as a group but they also don’t have the time to stop and say “O.K. what is it that I really want to concentrate on?” (F21).

Connecting Information

Five of the seven individuals interviewed discussed the role of reflection in managing information. For some this was a major function of reflection while for others it was only a part. Dr. Brooks defines reflection as being able to turn information into understanding: “I look for that kind of model in students, students who can take this information (about problem solving cases and research they have done) and run it around their heads-- I think that’s what we call reflection. And come up with an understanding of what they’ve been able to study” (K5).

According to Drs. Liberty, Bartels, and Brooks students are used to being given information rather than asking for or seeking it. When first entering medical school, many students have a very hard time organizing information and have a tendency to think there is one path to the “right” answer:

> I think one of the most essential skills that our students have to develop and the ones who are in academic difficulty cannot develop and that is to be able to pick out of a collection of information the most important points. Many of our students come in, (and) have no idea how to do that. So everything is at the same level of importance. These are the students who have trouble on problem-solving exams. In the same way they go to lecture and they can't sort out what's important. The student who has academic difficulty here, if you look at their lecture notes, it looks like dictation. Everything's important. (K7)

The problem solving process helps students to develop information seeking ability but those having difficulty cannot discern the most important information. They learn because they need to use it for the problem solving process. So using the information is beginning of reflection:

> Ok I have this piece of information, how does it relate to where I'm trying to go? That's a very very rudimentary step, but a lot of students can't take that step. When I ask them to justify something then they have to think about it. And I've often said in all of my public presentations that this is a curriculum which is just in time learning. They have to learn it because they need to use it in their problem solving process. Versus just in case learning, where it's just a case that's on an exam, they memorize it. (K10)

For Dr. Bartels, reflection is connecting pieces of information together:

> Because in my idea, that's the type of reflection that I'm used to, alright? Because as an educator and a researcher I would . . . .want to do this experiment. . . .Intuitively I knew this was the experiment that had to be done, but I would sit there and I would think about it until I knew what the steps were in my mind that brought me from over here to over here. So it was this process of reflection of tying point A to point B to point C to point D to finally to the hypotheses, that I was most interested in looking at (B10).

Like Dr. Brooks, Dr. Bartels and Dr. Liberty believe that reflection helps students to build knowledge by connecting information:

> Unless you make them go back and think about it, then they never connect it and they never really put it in their memory tree. You have to

> have something to connect it to or it doesn't stick. And so, that was what I was thinking about as reflection (B11)

> So their reflection on how they acquire information and present it and that type of thing is very important for their ultimately absorbing it all and developing their information about medical subjects that are going to be very important in their clinical years (L18).

Part of reflection is looking at how the person acquires and presents information. This part is necessary to really absorbing all the information that will be important in the clinical years. So PBL helps the students to interact with others and develop a good knowledge base. Dr. Hobbes notices that students become much better at synthesizing information by their second year of study. In the first year students primarily ask clarifying questions in the first year case wrap up.

Identity

Drs. Hobbes, Farmer and Cuttingham all discuss the role that reflection plays in professional identity. Reflection is not only about learning but about becoming:

> But then that big jump from being an second year and just sitting in class and learning, most of the time, and then you're seeing patients all the time in the third year. That is a big jump, sort of wearing that white coat fully. It's sort of like they have it partially on and as they age and mature they can actually put the whole thing on. And by the time they're out in practice they can actually button it (H21).

Part of becoming a physician is developing a professional identity. According to Dr. Cuttingham, people can think of their professional identity in a number of

ways that may change over time depending on what is happening in his or her life:

> One of the challenges of professional education is the development of a professional self identity and the incorporation of that in relation to someone's personal identity. And you can think about them in a number of different ways I think you could think about it, some people talk about professional/personal boundaries so they talk about the professional self and how you keep it separate from, you could see it as a professional self that's embedded inside a personal self so you could see it as a set of clothes you put on when you go to work and then you take them off when you go home. You could see it as a professional self that's sort of almost predatory that it kind of eats you up and there's nothing more of you left. You could see it as an extraordinarily enriching opportunity I think it's all of those things at different times for different people. So and it's been all of those things at different times for me (C13).

Throughout their educations, students receive countless messages about what it means to be a doctor. These messages come not only from educators but from patients who give feedback about how the student is being perceived as a professional and as a person. Physicians need to know how their personal values intersect with the professional decisions they will have to make. According to Dr. Farmer, very experienced physicians have brought their personal and professional values in sync and have a more integrated professional and personal identity:

> As I listen to the very seasoned faculty talk about their definition of professionalism, it's often . . . "I know my values and where I'm comfortable and I know my professional values and they weren't always in sync, but over time I've brought them to a place that I can live with-- that defines me in the larger community." We don't teach that. I don't know how to teach that and so in part I think that's part I think of the disconnect between this seasoned medical community saying we want to develop better professionals and we want to measure professionalism. And the students saying I'm a professional because I wear a tie (F49).

Developmentally, students do not understand this yet. With time and experience students learn that there is more to being a professional than simple appearances or “doing” particular activities. Dr. Cuttingham thinks formation of this new identity is going to happen regardless, but being aware that it is happening helps the student to more consciously develop:

> You don’t learn medicine, you become a physician. So it’s something about your own personal development. So I think it’s really important to have the self reflection piece because it’s going to happen to you anyway and so you should be conscious of what’s happening in order that you can you use and in order that you become a functional physician and not a dysfunctional one (C13).

Unfortunately, Dr. Cuttingham thinks medical education does not do a good job teaching students how to develop their professional/personal identity.

Differences

A couple of interviewees noted differences in reflection based on gender, generation, personality, and scientific orientation. Dr. Hobbes notices some of her older male colleagues are not as interested in reflection:

> I think it’s just the nature of us being women that we’re more in tune to our nurturing and caring side . . . (so) that we’re interested in that part in us and that part in others. . . . I don’t think he cares about that stuff. He just thinks it’s going to happen. So anyway, he doesn’t get it. . . . the faculty that I work with definitely get it. But again most of (them) . . . are more junior so I don’t know how you tease that out (H22).

Dr. Hobbes does not notice differences in student’s reflective abilities but has noticed that women students more frequently ask for feedback about their interactions in the group. She has never had a male student do the same and wonders whether this is because they are men or because they aren’t comfortable bringing this up with a woman. Dr. Hobbes also wondered if artistic

people may be more interested in reflection. Dr. Cuttingham also noticed differences in individual interest in reflection. She regularly incorporates writing and group process activities into her practice, but does not think this level of reflection is necessary for all physicians. She notes that some people are scientifically oriented and not very interested in reflection:

> I need to (reflect frequently and deeply) because that's who I am. My guess is that many people are very effective physicians who use reflection who don't do anything like that . . . . And that . . . would seem odd to them and I would seem weird for doing something like that. So I hesitate to push it too much. And I think it frightens people as well as feeling strange. And a lot people, a lot of medical students are very concrete, scientific because that's what they've (always) done. They're slightly scared, so I don't push it very much (C23).

Reflection and Academic Performance

In general there was consensus that students who try to rely on rote memorization will struggle in medical school. Dr. Brooks has a theory that high board scores mean a student is relying too heavily on memorization and is not leaving enough time and mental space to really reflect. According to Dr. Brooks, more relaxed students can do the self improvement piece of reflection:

> When a student has had performance problems, like they've failed a block or something like that, they revert to their old methods of studying and learning, which is to spend hours, and hours, and hours going over stuff and trying to almost rote memorize it and that's out of fear. Versus the student who is doing very well and now is relaxed enough and can begin to think about what they're doing and to do that self-improvement piece that's so important about relating to the reflection. What I have to do as a tutor is make them feel better and more confident about their ability to put that deficiency behind them and improve. (K19)

There was not agreement on the relationship of reflection and academic performance. This was probably due in part to differences in definitions of

reflection. Both Dr. Brooks and Dr. Cuttingham mentioned that the smartest students are not necessarily the most reflective. Dr. Cuttingham mentioned that the most outstanding graduates seem to have strong reflective abilities and would be people that patients would recognize as good doctors. Dr. Bartels did not see a relationship between academic performance and reflection but guesses that students who are strong reflectors but struggle academically are probably not good test takers.

Dr. Farmer and Dr. Miryck see students in academic difficulty showing a great deal of reflection. Dr. Miryck finds these students motivated to identify their weaknesses and try something different. Dr. Farmer notes that students who struggle in their early years deal with issues of commitment and worthiness:

> I think the people who actually do quite a bit of reflection are the people who struggle academically. And I've had repeated conversations across the years from students who, the story goes, "I never had to study through my undergraduate. I knew I was smart. I was smarter than all of my peers." And they're not arrogant about that, but that's what they're trying to tell me. "And I got here and all the rules changed and I just don't really know if I'm worthy, or if I can do it". Or, you know, "I've had to examine my commitment to this." And I think that's pretty reflective (F41).

Those who make it through a struggle use their own experiences to understand another person's struggle and often receive positive comments regarding their ability to provide patient centered care in their clinical years.

Assessment of Reflection

Most interviewees say they need some kind of external evidence to know a student is reflecting. Dr. Liberty knows when students are reflecting because they ask questions or talk to him about some aspect of their roles. For Dr. Miryck, improvement in other areas may show the student has done some self reflection:

> As they go along they may comment on how they're trying to improve this or that, their teaching ability, their thoroughness in a learning objective, or you know their participation in class that you notice that and you may comment on that under the self-reflection category. But it's something at least the way we do it now it's fairly limited in directing them towards self-reflection in a measurable way (M7).

It is hard to know when you are seeing reflection, but lack of effort to improve seems to indicate the student is not effectively self reflecting: "Well it kind of overlaps with professionalism I think. If there's a lack of effort to improve then you're not meeting your responsibility to the group so you might say that . . . a student who lacks professionalism is not doing effective self reflection" (M24). For Dr. Cuttingham the evidence of reflection might be a shift in behavior or having or overhearing a conversation with a student. Several of the tutors point out the sustained nature of their interaction with students as providing opportunity to observe their reflection. Dr. Hobbes points out that self reflection cannot be assessed by someone observing students only once or twice because the items are about a pattern of behavior:

> I think I would refuse to answer any of that in a student I'd only seen once or twice because it's more a pattern of behavior and it would be very challenging-- like if I had a student in my clinic just one half day, I don't think I could answer that. I don't think I could answer any of those questions. So for me when I'm answering those questions I think after four weeks I can answer them, but definitely after 8 weeks in PBL it's actually a lot easier. So again it's observing how the group is working, how the students are responding to feedback (H11).

Assessing reflection takes time. It is not something easily seen after a brief encounter. Dr. Liberty also mentioned assessment in PBL is easier because he really gets to know the students after being with them ten hours a week for eight weeks.

Phases of Reflection

As you will recall from Chapter 2, Atkins and Murphy (1993) identified an overarching reflective process common to many theories of reflection. The process includes (a) a trigger of uncomfortable feelings or thoughts with a realization that current knowledge is not sufficient in the situation, (b) critical analysis which is an examination of feelings and/or knowledge, resulting in (c) new perspective/learning. Below, the differing views of those interviewed are organized according to this structure. Faculty interviewed tended to emphasize one of these stages rather than addressing the full process of reflection. In general, most attention went toward triggers of reflection and on the new perspective gained.

Trigger of uncomfortable feelings or thoughts

Several people highlight the importance of surprise or a unique circumstance to prompt reflection. Some specifically address reflection in medical practice:

> It's sort of like you're on autopilot a lot and all of a sudden-- well okay, now I'm not. I think that physicians have to do that. I think other people have to do that too and sometimes it's because something has gone wrong technically, sometimes it's the wrong diagnosis, sometimes it's because something else is happening, it's become life threatening, this one's going to die, or this one's really dangerous and then instead of doing the automatic thing I have to address the relationship in a different way (C29).

> Now 90% of the time, probably 95% of the time it's not going to make any difference really because the algorithms they use are good enough that their going to cover 95-99% of the people that walk in the door. But there are going to be a few strange cases where they actually need to think (B14).

Others discussed triggers specific to the medical students. Several mentioned the curriculum itself as triggering surprise and discomfort for many if not most of the students. Problem based learning forces students to take responsibility for their learning in a way most traditional education settings have not. In addition, most students had to compete fiercely for their place in medical school and are very surprised by the level of cooperation necessary for success. Lab members are responsible for the content that others receive so “slacking” impacts the whole group. This new situation may encourage students to reflect about their role and how they fit into the big picture. They also receive feedback from their lab partners and tutors about their performance that may trigger reflection.

Critical analysis

This is the action part of the reflection process in which the individual examines knowledge or feelings. During interviews, this phase of reflection was the least addressed which was a little surprising. Given the medical environment I expected more emphasis on critical thinking. Those who did discuss this phase talked about making connections, acquiring information:

> Unless you make them go back and think about it, then they never connect it and they never really put it in their memory tree. You have to have something to connect it to or it doesn’t stick. And so, that was what I was thinking about as reflection (B11).

Students also critically analyze their new roles as well as their place in medicine:

> I think reflection, the way I’ve heard it used, is sort of an individual’s ability to . . . look at the big picture and see where they’re fitting in and reflecting on their role in that big picture (L2).

> (Students in academic difficulty will say) “I knew I was smart. I was smarter than all of my peers.” And they’re not arrogant about that, but that’s what they’re trying to tell me. “And I got here and all the rules changed and I just don’t really know if I’m worthy or if I can do it”. Or, you know, “I’ve had to examine my commitment to this.” And I think that’s pretty reflective (F41).

Comments related to this phase were not detailed descriptions but rather references to this active phase of reflection rather than to prompts or the outcomes.

New perspective

The outcome of reflection is a new perspective (i.e., learning). Again, some interviewees concentrated more on outcomes than others. For some, the self improvement aspect of reflection was key:

> When I use my experiences and my observations particularly my self observations to develop a personal quality, it becomes an improvement activity. In other words, ok “I just listened to the heart, and then I think did I do a very good job? I didn’t hear it as well as I think I should have because I didn’t put the stethoscope where I think I should have put it,” that’s the reflection which causes people to improve (K11).

One interviewee was particularly focused on the learning associated with reflection. He was not sure what prompted reflection and was especially uncomfortable speculating on another person’s internal process (critical analysis). He did however believe that learning was evidence of reflection. If the student has changed, he or she must have reflected:

> That they are aware and monitor their own work, the quality of their work, thoroughness, various qualities I think. And then are interested in improving and getting feedback and then implementing changes that you can see – that you could document in their performances over the areas in PBL (M5).

Or if the student has not shown change, he or she is not effectively reflecting:

> Well it kind of overlaps with professionalism I think. If there's a lack of effort to improve then you're not meeting your responsibility to the group so you might say that . . . a student who lacks professionalism is not doing effective self reflection" (M24).

This touches on some of the difficulty of assessing reflection mentioned by a couple faculty. It is difficult to know when someone has reflected but some people reason that a person must have reflected if they learned. Most interviewees said external evidence was needed in order to know if a student has reflected. A couple of those interviewed were particularly concerned with the subjective "mind reading" needed to assess reflection.

Types of Reflection

Because the tutor evaluation of first and second year students was locally developed by curriculum leaders, it was analyzed as an artifact of their thinking related to concept of reflection. All available developers were interviewed and unfortunately had limited memory of how individual items related to reflection were chosen. The developers and additional tutors were asked about how they currently use the evaluation. In general even developers were unsatisfied with the version of reflection measured in the Self Reflection section. Only one individual interviewed thought the self reflection portion of the evaluation matched his own view of reflection. Others thought it lacked some major component of their own definition. Faculty tended to have themes to their interviews which emphasized one type of reflection more than others. In addition, most focused on benefits or purpose of reflection which made it difficult to

discern to which specific type of reflection they referred. The following illustrates interviewees' perspectives on the different types of reflection.

Scientific

Scientific Reflection is defined as the critical appraisal of the literature and one's own practice with the key function of optimizing scientifically-based clinical decisions. It is related to the more technical and objective aspects of reflection in medicine. Aukes et al. (2007) relate this type of reflection to Schon's (1983, 1987) Reflection-on-Action. Several of those interviewed consider the ability to critically appraise information an important factor in students' success:

> I look for that kind of model in students, students who can take this information (about problem solving cases and research they have done) and run it around their heads-- I think that's what we call reflection. And come up with an understanding of what they've been able to study (K5).

> Unless they are actually trying to connect all of these things through basic science and say "Yes this does make sense", instead of just using this blind formula that so many of them use now-a-days, then they're not thinking about what they are doing. And I want them to think about what the process is. How they are making a diagnosis. I think that is really critical. If they don't make the right diagnosis, you're not going to get well (B14).

When first entering medical school, students are used to being given information rather than asking for or seeking it. Many have difficulty organizing information and have a tendency to think there is one path to the "right" answer:

> Many of our students come in (and) have no idea how to do that. So everything is at the same level of importance. These are the students who have trouble on problem-solving exams. In the same way they go to lecture and they can't sort out what's important. The student who has academic difficulty here, if you look at their lecture notes, it looks like dictation. Everything's important. (K7)

For some, the term reflection was basically synonymous for the critical appraisal of information. For others it was a part of the way they described reflection.

Clinical

Clinical Reasoning is defined as problem and patient-oriented understanding, judgment and decision-making with the key function to solve a patient problem. Aukes et al. (2007) relate this type of reflection to Schön's (1983, 1987) Reflection-in-Action. This patient-oriented problem solving was the focus of comments for some of those who were interviewed. Physicians must use feedback from all possible sources to help their patients:

> So I guess I could say it doesn't really matter if it's the patient or other people on the team whether they're doctors or nurses. It happens a lot on the wards and the clinics when they (students) have to pick out all the feedback and cues they're getting on a moment by moment basis. In fact the second year student that I had in clinic yesterday picked up on a lot of nonverbal cues on a patient of mine, a brand new patient of mine who seemed very defensive to me (H16).

Even after much experience when practice becomes more automatic, unusual events may prompt clinically related reflection:

> what you have to think is that the model doesn't fit or there's something else going on, or that's when the reflection becomes part of clinical practice. I think surgeons do it, you know a lot of the time it's like- I've taken out 10 appendixes. "Oh this one is going wrong." You know, it's kind of stepping back and it's not automatic anymore. I think (that's) what people call reflective practice (C29).

Although students do not see patients as regularly in their first 2 years of study as they will in their last, they do have some interaction with patients and

opportunities to observe experienced practitioners. PBL cases also provide the opportunity to practice.

Personal

Personal Reflection is thinking about experience (your own and others) with the key function to make sense/meaning related to practice, thoughts, emotions, and beliefs. In the spirit of Schön (1983, 1987), Aukes et al. (2007) call this type of reflection Reflection-on-Experience. Most of those interviewed discussed the importance of reflection in making meaning:

> The medical students . . . are getting this huge amount of information being thrown at them and they have to make sense out of it. Which I think is the basis to constructivist learning. That I think is the beginning of reflection for the students. Once they find that they cannot digest all of this information without making meaning for themselves (K28).

> Being dependent on their fellow students to get correct information and to get the necessary information for an exam— I think there's a fair amount of trepidation on their part. I think that in turn causes them to reflect about the roles that they're playing. How to best do them; they observe their classmates and how they're doing them. And that type of thing— trying to accommodate how they fit in (L5).

> You have to be able to keep thinking when you are very emotionally stirred up. And if you don't have a self reflection piece, you're not even aware that you're emotionally stirred up and (of) how it's affecting your thinking processes. You have to be able to keep thinking, keep functioning, keep being available, keep being empathetic, keep being patient, tolerant, be calm, be understanding, absorb an awful lot of emotion and then go away and leave it. So you have to be absolutely ruthless (C19).

This type of reflection encompasses reflection in many different contexts. Those interviewed discussed Personal Reflection as helping students develop medical knowledge, learn new roles, and manage emotions in clinical situations.

Reflection is often discussed in terms of looking back to an experience, but some of those interviewed talked about reflecting on experiences to figure out how they would act in the future:

> They're going to be put in positions where they're going to have to make difficult decisions either about withdrawing care, end of life care, or abortion, teenage pregnancies. I think they need to be very aware about what they feel personally and have a mental conversation with themselves about what they feel is appropriate professionally and those two may not be the same thing (F48).

This requires the person to consider future experiences in light of past experiences that have influenced their values and biases on various topics.

General.

General Reflection is defined as a cyclic process of assessing one's own thinking and behavior with the key function of self-regulation (Korthagen, 2001; Driessen, 2005). This type of reflection was not part of the original types defined by Aukes et al. (2007). It refers to thinking that bridges all of the other three types of reflection:

> The ability to know your boundaries, things that you're good at and the things that you need to work on. It's the ability to say you know -- I'm living my life or I'm doing my practice or I'm organizing my professional life in a way that is consistent with my values. And I think that it's particularly important for our medical students. Because at the end of the day they need to know what their personal values are and they probably don't quite yet. It is knowing and being thoughtful about where the next step is so that I don't just finish medical school . . . and say "Ok. That's it I'm done"— that professional responsibility for continual growth, not only professionally but personally (F45).

The reflection to which this person speaks is not specific to clinical, scientific, or personal reflection. As will be discussed below, it does bear on all the others.

Summary

Although I noted overlap in the ways faculty interviewees define reflection, each person had an overarching focus and unique way of looking at reflection. Most focused on the triggers and outcomes of reflection rather than on the critical analysis phase of reflection. Faculty discussed all types of reflection including scientific, clinical, and personal but most emphasized learning from experience. Some highlighted the role reflection plays in building a professional identity while others equated reflection with understanding roles and figuring out how one fits in. Other focuses included the following: (a) reflection as thinking about thinking—trying to figure out how one knows what they know, (b) reflection as answering the question “why” and seeking information, (c) reflection as monitoring performance and using feedback to make improvements, (d) reflection as “soul searching” that originates from within, (e) reflection as considering personal experiences in order to understand another person, and the (f) reflection as key to medical decision-making. Most said they need some kind of external evidence to know a student is reflecting such as asking questions, overhearing a conversation or noting improvement in another area, but a couple of those interviewed were particularly concerned with the subjective nature of assessing reflection.

Faculty also addressed the purpose of reflection with some emphasizing more immediate benefits like fitting in with the PBL group while others focus on longer term implications such as increased likelihood of delivering patient centered care or becoming a functioning physician. All of those interviewed

addressed what he or she believes prompts student physicians to reflect. The MDs interviewed also discussed things that prompt reflection in their own practice. Five of the seven individuals interviewed discussed the role of reflection in managing information. For some this was a major function of reflection while for others it was only a component. One defines reflection as being able to turn information into understanding. Three of the seven interviewed specifically discuss the role that reflection plays in professional identity. For them, reflection is not only about learning but about becoming. A couple of interviewees noted differences in reflection based on gender, generation, personality, and scientific orientation but in general this was not a common theme.

CHAPTER FIVE

FINDINGS: TUTOR EVALUATIONS

The tutor evaluation is used in the first and second years of study to provide feedback to students on their performance in problem based learning and patient care. The following performance categories make up the evaluation: (a) Participation, (b) Group Interaction in Learning, (c) Problem Solving, (d) Integration and Synthesis, (e) Sources, (f) Critical Thinking, (g) Self-Reflection, (h) Self-Directed Learning, (i) Professionalism, (j) Overall. Each section has three performance levels: Unsatisfactory, Satisfactory, and Superior. There are behavioral descriptors under each section. The tutor can give the student an overall score for each section, and also provide feedback by checking behaviors at any level as applicable. So for example, a student can receive a Satisfactory in Participation but still receive feedback that in certain areas (i.e., tendency to dominate discussion) the student's behavior is considered Unsatisfactory. The one exception is the Professionalism section in which the levels are Unsatisfactory, Marginal, and Satisfactory.

In this chapter, the development and use of the tutor evaluation is described and analysis of the evaluation is presented. The tutor evaluation was analyzed in several ways. The overall class performance on the evaluation was analyzed for usage patterns across tutors. Items were also analyzed to determine the types of reflection being assessed. Lastly, individual performance on the "Self Reflection" section was analyzed in relation to answers on the

reflection narratives completed at the end of each year. The last analysis is described in Chapter 6.

Developing the Tutor Evaluation

The tutor evaluation was developed by a faculty group facilitated by Dr. Farmer in 2003. Because a significant amount of time has lapsed, those interviewed could not remember many details of the evaluation development. Doctors Bartels, Liberty, and Miryck were all involved in the development of the evaluation as were two individuals who have since left the university. All members of the group were curriculum leaders. In general, the group brainstormed categories and spent much of their time developing descriptors for the various levels of performance (satisfactory, superior, unsatisfactory). The group came up with items and discussed their importance until coming to a consensus.

Dr. Farmer remembers faculty feeling that students had become “sloppy” with the PBL process. It was determined that the previously used one-page evaluation lacked detail and the students were not getting timely feedback. The development group worked to provide more detail around the different skills and abilities needed in PBL. The evaluation was also adapted for use in the patient care course. The tutor evaluation became the first online evaluation tool to be used by the school. An evaluation of student perceptions of the quality of teaching was created in unison. Results of the tutor evaluation and online reporting of student grades formed the foundation for what was to become the student portfolio.

One of the tutors thought that Dr. Farmer might have originated the self reflection category, however she thought it was another group member who is no longer with the university. Dr. Farmer remembers that the faculty wanted students to be more thoughtful about their role in PBL. From their perspective, it was important for the students to use feedback from peers and tutors to change performance. So this became the focus of the self reflection section. In general, Dr. Liberty thinks the descriptors under the Self Reflection match his definition of reflection. Dr. Bartels remembers becoming uninterested in this section when the definition of reflection began dramatically diverging from his own ideas which focused on students verbally justifying their thoughts and decisions during PBL.

Both Dr. Bartels and Miryck had concerns about the self reflection section because they believe it tries to assess a student's thinking. It is difficult to measure the goals that students might set for themselves. Dr. Miryck suggests that other activities, such as reviewing a videotape of an interaction with a standardized patient, allow the student to pick specific areas of improvement. But unless the student tells the tutor he or she wants to improve or asks for feedback, the tutor can't know the student's intentions. Self reflection might not "come up" for every student for every block. Dr. Miryck uses changes from mid-block to the end of the block as evidence that the students have done some reflection. Dr. Miryck suggests that faculty could use some training on assessing more subjective areas of student performance.

Using the Tutor Evaluation

The tutor evaluation is designed to be used formatively midway through the block. At this time, tutors fill out the form but it is not part of the student's record. At the end of the block, the tutor can review for changes and then save as the final evaluation. All tutors interviewed meet with their students at mid-block to discuss performance. They spend between five and fifteen minutes with each student.

Tutors use different methods for completing the evaluation. Some take notes about student performance during PBL sessions. Other tutors feel this disrupts the group process because students are concerned about what the tutor may be writing. Those tutors tend to make notes after the session. Two tutors mentioned keeping the form categories and descriptors in mind while making observations and notes. Some are more systematic with notes than others. One tutor rates each student weekly on overall performance and professionalism on a 1-10 scale. This rating helps the tutor see patterns of behavior. Another tutor does not make a written record of negative comments because he fears misinterpretation of these comments could harm the student. Negative comments are instead provided in person.

Two of the tutors only fill out the "Overall" sections of the evaluation. They fill out none of the performance sections. One considers the behavior descriptors "too standardized" to be useful and the other considers the evaluation too long, repetitive, and that many of the satisfactory statements are worded negatively. Three tutors fill out the entire evaluation. Of these three, one tutor thinks the

check boxes with anchors makes the feedback to students more robust because it would be impossible to write out that many comments for each student. This tutor gets frustrated with complaints that the form is too long because it only takes fifteen to twenty minutes per student. The other two tutors complete all sections but concentrate efforts on the behaviors that are easier to observe: good sources, audiovisuals, skill as a teacher, how the students interact with each other. Both of these tutors mentioned discomfort evaluating things they could not directly observe such as reflective ability. Both said they were not “mind readers”. There appear to be three approaches to completing the tutor evaluation: a) completing only the overall section, b) filling out all sections as completely as possible, c) completing all sections but concentrating on behaviors most readily observed. The next section provides an aggregate view of how the tutor evaluation is used.

Analyzing Class Performance

Class performance on the tutor evaluation was analyzed for the first and second year of study of the students whose reflections are analyzed later in this chapter. This includes data for all members of their cohort class (n= 96 incoming). As a reminder, students participate in Blocks 1-4 in Year 1 and Blocks 5-8 in Year 2. They have PBL tutors in all blocks (for a total of 8) and Patient Care tutors in Blocks 1-6. However, tutor rating for the Patient Care course were not available, so for each section each student has up to eight ratings. The information below describes ratings given and which descriptors were assigned for all 96 students across all blocks for each section. Figure 3 is provided to

clarify the data structure. In the first block 26% of all students received a Superior in Self Reflection. Although they did not receive an overall rating of Superior in this area, additional students received feedback that they were Superior in their ability to self assess and improve as evidenced by a greater percentage being marked Superior for this descriptor.

Table 3: Structure of Tutor Evaluation Data

Self Reflection Section	*Blocks*			
	1	*2*	*3*	*4*
Overall Rating: Superior	26%	51%	70.5%	49.5%
Continually appraises and assimilates scientific evidence to refresh knowledge base	15.6%	34.4%	43.2%	37.9%
Evidence of self assessment and improvement	38.5%	46.9%	68.4%	51.6%
Self critical and monitors own behavior	42.7%	59.4%	66.3%	47.4%

This information provides a sense of how the evaluation is used by all tutors. Tutors are only required to fill out the “Overall” section rating and must provide comments, however most tutors do provide ratings for each section. For each section, between 81-100% of all students received individual ratings for the two years analyzed. No student received an Unsatisfactory rating for an entire section in Year One; however, one student did receive an Unsatisfactory in Critical Thinking in the first block of the second year. In the Professionalism Section, one student earned a marginal rating in a Year One block as did three

students in Year 2 blocks. For most sections, half or more students received a Superior rating. There are a few exceptions which are noted below.

Participation

Between 67-85% of all students in a block received a Superior rating for Participation for Blocks 1-8. A significant decrease in Superior ratings was noted from 78% in Block 6, to 68% in Block 7, and finally to 48% in Block 8. In Block 8, students are very concerned with studying for boards which may partially explain the drop in ratings. Students consistently got high marks for discussion and active listening (64-79% in all blocks) and not shortcutting the process (61-79% in all blocks).

Group Interaction

Across all blocks, about 3/4 of all students received a Superior in Group Interaction with the remainder receiving a Satisfactory. Superior ratings increased across Year One for verbal and nonverbal communication.

Problem Solving

Between 15 and 33% of all students earned Satisfactory in Problem Solving across all blocks. The remainder earned Superior. Students consistently got high marks for effective use of prior knowledge (65-86% of all students for all blocks). One student received Unsatisfactory feedback for failing to recognize and track key issues in the case for blocks 4 and 5. One student received an Unsatisfactory for missing information in context.

Integration and Synthesis

Between 41-79% of all students received a Superior rating across all blocks. One student received Unsatisfactory feedback for asking superficial or distracting questions. The lowest percentage of Superiors occurred in the first block.

Sources

Between 31-71% of students received a Superior in any given block. In five of eight blocks, half or less of all students received a Superior. This was less than most other Sections. In three different blocks, one student received Unsatisfactory feedback for presenting information that did not promote learning, showing preference of using easy and superficial sources, and using less rigorous sources.

Critical Thinking

Between 50-77% of all students received a Superior rating for Critical Thinking. One student received an overall Unsatisfactory rating for Critical Thinking in the first block of the second year of study. Students consistently got high marks (66-90%) for their ability to apply knowledge to problem.

Self Directed Learning

Between 32-73% of all students received a Superior rating for Self Directed Learning. The lowest percentage was in the first block of the first year of study. The percentage increased across the blocks then dropped in the last two blocks of the second year of study to 48% in Block 8. One student in each of two

blocks received Unsatisfactory feedback related to struggling to learn and keep up with group.

Professionalism

Between 87.5-99.0% of all students received a Satisfactory rating for Professionalism. This is the highest rating possible. No student received an Unsatisfactory rating for Professionalism nor did any student receive Unsatisfactory secondary feedback. In each of two blocks, one student received a marginal rating for professionalism. For one block two students received a Marginal rating. For two additional blocks, students received Unsatisfactory feedback due to showing arrogance and intolerance of others beliefs and values.

Self Reflection

Between 26-70% of all students received a Superior rating for Self Reflection. The remainder earned Satisfactory. In the first year, although all received section levels of Satisfactory or Superior, one student per block received secondary feedback that was Unsatisfactory because they did not use feedback to improve performance, resisted suggestions from peers or tutors, or were unaware or unconcerned about their role in the group. Fewer students received Superior ratings in Self Reflection than most other performance areas. For six of eight blocks, half or fewer received Superior.

Analyzing the Type of Reflection

In this study, the items faculty developed to assess reflection were coded and counted according to the type of reflection they appear to assess. The tutor evaluation items were categorized using Aukes et al. (2007) description of types

of reflection in medicine: Clinical, Scientific, and Personal. Clinical Reasoning encompasses the view of doctor as expert. It is problem and patient-oriented understanding, judgment and decision making. Scientific Reflection encompasses the view of doctor as scholar and involves critical appraisal of literature and own practice with the main goal of optimizing scientifically-based decisions or evidence-based medicine. Personal Reflection encompasses the view of doctor as a person. It involves considering experience (own and others) in order to make sense/meaning.

In coding the descriptors, the types of reflection outlined by Aukes et al. (2007) did not adequately cover all descriptors. Some descriptors applied to all three types of reflection which indicated some overarching reflective skill. Therefore I developed the General code for such overarching descriptors. Also, a Mindfulness category emerged from the coding. These descriptors specifically targeted a student's presence and mindfulness in a given situation. A detailed description of the definitions used can be found in Appendix G.

Although there is a section specifically called "Self Reflections", items in all sections were analyzed. See Table 4 for examples of descriptors assessing each type of reflection.

Table 4: *Examples of Each Type of Reflection*

Type of Reflection	**Descriptor**
Clinical	Consistently goes beyond the cases to integrate knowledge
Scientific	Able to link basic science information with clinical manifestations
Personal	Actively learns from others and helps teach others
General	Effective use of prior knowledge
Mindfulness	Interested, engaged, active learner from day one

Items assessing reflection permeate the evaluation even if it is not called such. Items assessing reflection are found in all but two sections of the evaluation. Consistent with the literature, the largest portion of the descriptors assesses Scientific and Clinical reflection. Table 5 details the result of this analysis.

Table 5: *Type of Reflection by Section*

Section	*Scientific*	*Clinical*	*Personal*	*General*	*Mindful*	*None*	*Total*
Participation	3	2	0	0	7	7	19
Problem Solving	11	14	0	1	0	0	26
Group Interaction	6	0	8	0	5	18	36
Integration & Synthesis	6	1	0	2	0	2	11
Critical Thinking	5	8	0	0	0	4	17
Sources	0	0	0	0	0	10	10
Self Reflection	5	0	7	6	0	0	18
Self Directed Learning	1	0	0	2	0	5	8
Professionalism	0	0	0	0	2	17	19
total	37	25	15	11	14	63	164

The Scientific and Clinical Reflection descriptors were found throughout the tutor evaluation except in the sections assessing the student's use of source materials and professionalism. No type of Reflection is assessed in the Professionalism section which is a little surprising. In the Problem Solving Section, all descriptors were coded as assessing one or more types of reflection.

Unlike Clinical and Scientific Reflection which are seen throughout the evaluation, Personal Reflection was only seen in the Group Interaction and the Self Reflection Sections. Descriptors for General Reflection were seen in the Participation, Integration and Synthesis and Self Reflection Sections. Mindfulness was seen in the Group Interaction, Participation, and Professionalism sections.

Summary

The tutor evaluations used to assess first and second year students were analyzed to determine the types of reflection being assessed (Scientific, Clinical, Personal, General) and for usage patterns across tutors. Analysis of performance on the evaluation by the class as a whole showed that students rarely receive an Unsatisfactory in any performance area and for most sections more than half of the students receive a Superior rating in any given block of study. For the Self Reflection portion of the evaluation between 26-70% of all students received a Superior rating depending on the block. The analysis of items for reflection type showed that Aukes et al. (2007) descriptions did not adequately cover all evaluation items. Some evaluation items appeared relevant to all three types of reflection which I interpreted as indicating some overarching reflective skill. Therefore a General code was added for such overarching items. Also, a Mindfulness category emerged from the coding. These descriptors specifically targeted a student's presence and mindfulness in a given situation.

Although there is a section of the tutor evaluation specifically called "Self Reflections", items in all sections were analyzed. Items assessing reflection

permeate the evaluation even if it is not called such and are found in all but two sections of the evaluation (Sources and Professionalism). Of the 88 items assessing reflection, 62 assess Scientific or Clinical Reflection which is consistent with the literature. Table 15 details the result of this analysis.

Table 15: *Total Number of Items Coded by Type of Reflection for All Sections*

Scientific	*Clinical*	*Personal*	*General*	*Mindful*	*Total*
37	25	15	11	14	164

Unlike Clinical and Scientific Reflection which are seen throughout the evaluation, Personal Reflection was only seen in the Group Interaction and the Self Reflection Sections. Descriptors for General Reflection were seen in the Participation, Integration and Synthesis and Self Reflection Sections. Mindfulness was seen in the Group Interaction, Participation, and Professionalism sections.

CHAPTER SIX

FINDINGS: REFLECTION NARRATIVES AND RELATIONSHIP TO TUTOR EVALUATION

At the end of the first and second years of study students are asked a series of guided questions designed to encourage reflection upon their development as a student physician (see Figure 4).

Figure 3: *Guided Reflection Questions*

Q1--What are the patient centered care qualities that you would want a patient and his/her family to identify in you over the next year? Please explain your reasons.
Q2-- Which of the graduating medical student Key Characteristics are your current strengths? Please provide examples.
Q3--Please describe in detail how you will continue to further develop these strengths (graduating medical student key characteristics).
Q4- Which of the graduating medical student Key Characteristics will need your attention over the next year? Please explain.
Q5-- How do you think professionalism relates to the graduating medical student key characteristics? (Year One only)

These questions ask students to reflect on their progress on the eight graduating medical student competencies which include the following: (1) Able to deliver effective patient centered care (PCC), (2) Critical thinking and Problem-solving, (3) Committed to life-long learning and information mastery, (4) Committed to improving quality and safety, (5) Knowledgeable in biomedical sciences, evidence-based practice, and societal and cultural issues, (6) Honest with high ethical standards, (7) Able to collaborate with patients and other members of health care team, and (8) Able to communicate with patients and others.

In this chapter, the development and use of the reflection questions are described and analysis of the questions is presented. The responses to reflection questions were analyzed for emerging themes and were assigned a Level of Mindfulness as defined by Epstein (1999).

Developing the Reflection Questions

Responses to reflection questions become part of the medical student's portfolio. The portfolio began when first and second year grades and the tutor evaluation were moved to an electronic format and made available to students through their student home page. Once this system was built, Dr. Farmer started talking to others about how to turn this data into information the students could use. This is how the portfolio came into existence. Before implementing the reflection questions Dr. Farmer got buy-in from curriculum leaders for the general idea of using a portfolio as a means of professional development for the students. Due to researching best practice in portfolios, she decided this school's portfolio would have a reflective component. Dr. Farmer built support for the use of a reflective component by a) emphasizing the more complete view of professional competence it provided, b) laying out the national picture which was moving toward the use of portfolios, and c) pointing out ACGME support for this type of activity. There had already been talk among curriculum leaders of finding ways to discourage students' obsession with exams and board scores and the portfolio was presented as a way to accomplish this goal.

Stimulated by work on the student portfolio, the reflection questions started as informal conversations between Drs. Farmer, Hobbes and Warner.

Although the earliest versions of the portfolio began as an electronic file cabinet for student grades and results of tutor evaluations, these individuals wanted a reason for students to look at the information and consider their performance across the entire year. The questions build into the curriculum a formal mechanism for students to reflect on their performance data, personal ability, and plans for the future. The questions were designed to occur at critical transitions to help students envision the kind of doctor they want to be.

According to Dr. Farmer the purpose of the Reflection Questions are to provide an opportunity for quiet reflection, to sensitize the students to what they should do in practice, and to meet an LCME requirement that stated outcomes be documented. Dr. Farmer believes some of the school's stated outcomes cannot be achieved without reflection. Both Dr. Farmer and Dr. Hobbes mentioned that the reflection questions provide the opportunity for students to step away from action and think- particularly at critical transitions. Dr. Cuttingham thinks the questions help students develop the skill to consider their own values in relation to something external to themselves:

> Then when you are in any other place in your life and you're expected to think about yourself in relation to an external set of values, or a diagnostic scheme, or an insurance company protocol whatever else it is; you have a way of saying "here's how I think about that". It's learning a technique almost. But it's a little more than that. It's about learning . . . how you . . . think about yourself, but it's also about becoming conscious about what your value system is and (to) have a reaction to that so you know where you stand (C31).

The reflection questions were implemented several years ago. There was very little pushback from faculty probably because the process is centrally administered so there is nothing for them to do. The first year, students were not

required to answer questions. Although not required, almost all first year students did them, but second year had a lower response rate. The next year, the questions were formalized into the curriculum by making them a second year course requirement. Although not technically required in year 1, in order to complete the required assignment in Year 2 students must have completed their Year 1 reflections. Those involved felt the questions had to be a requirement to ensure student action.

The purpose behind the reflection questions was not well communicated in the first year of implementation. Although not true, a rumor started that students had to complete the questions for faculty research purposes. Students obviously did not understand the personal benefit. In response, Dr. Farmer made presentations to various faculty groups so that more were aware of the reflection questions and could support the activity if students brought it up. The next year a panel of very experienced physicians talked to the classes about the role that reflection plays in their practice and professional development. Reflection questions are beginning to be used in the third year of study. Dr. Hobbes noted the culture seems to be shifting and that the current third year students simply expect to do the reflection questions.

Currently there is no mechanism to provide feedback to students regarding their reflections. The students are told they must do the reflections but that faculty and administrators only look at de-identified information. This is an attempt to create a safe space for students to explore. Last summer Dr. Hobbes and Dr. Miryck participated in a pilot evaluation of the portfolio. Both found the

process interesting in that some students gave very thoughtful responses while others obviously did not take it seriously. The evaluation of the portfolio is a work in progress. In addition, plans are being made for students to receive small group and individual coaching from a physician regarding their progress toward achieving the graduation competencies.

Emerging Themes

Table 7 shows a ranking of the graduating medical student key characteristics by the number of times students mentioned them as strengths in their first and second year reflections.

Table 7: *Strengths Across Two Years of Medical School*

Year 1			Year 2		
Rank	*Characteristic*	#	*Rank*	*Characteristic*	#
1	Ethical & Honest	22	1	Knowledge	15
2	Problem Solving	17	2	Communication	14
3	Communication	14		Problem Solving	14
4	Collaboration	12		Ethical & Honest	14
4	Lifelong Learning	12	3	Lifelong Learning	13
5	Knowledge	7	4	Collaboration	9
6	Patient Centered Care	4	5	Patient Centered Care	5
7	Quality & Safety	2	6	Quality & Safety	2

More than double the number of students considered thought their Knowledge was a strength in their second year as compared to the first year. In

the first year, more than 2/3 thought their honesty was a strength. In the first year, students have not had as much information related to ethics and so narratives are focused on honesty which many consider an innate quality. In the second year, honesty and ethics still ranked high but fewer students (n=14) considered it a strength. This may reflect a more sophisticated view of ethics given their exposure in the curriculum. The other numbers did not change substantially. About half of the students considered Problem Solving to be a strength in both their first and second years of study. The school has a problem based learning curriculum, so it makes sense that the students would have confidence in these abilities. Patient Centered Care and Quality and Safety both remained low on the list.

Table 8: *Areas to Improve Across Two Years*

YEAR ONE			YEAR TWO		
Rank	*Characteristic*	#	*Rank*	*Characteristic*	#
1	Knowledge	24	1	Knowledge	14
2	Problem Solving	8	2	Patient Centered Care	11
2	Communication	8	3	Communication	8
3	Collaboration	6	4	Collaboration	7
4	Patient Centered Care	5	5	Quality & Safety	6
5	Quality & Safety	3	6	Problem Solving	4
6	Ethical & Honest	1	7	Lifelong Learning	3
7	Lifelong Learning	0	8	Ethical & Honest	1
				Other	2

Knowledge remained the highest ranked characteristic needing work over the next year, however, ten fewer mentioned this characteristic in their second year than did in their first year of study. This may indicate more confidence after another year in the basic science PBL and Intro to Patient Care curriculum. Problem Solving dropped from number 2 to number 6 in the rankings from the first to the second year. Concern with patient centered care doubled from the first to second year. This makes sense given that students completed these reflections right before starting their third year which includes the seven core

clerkships. Concern with Ethics and Lifelong learning remained low across the years. Although ranked the same across the years, twice as many were concerned with Quality and Safety in the second year as in the first.

Students said they would continue developing their strengths by participating in the curriculum, having opportunities to practice skills, and by completing readings in the next year (Year 1 = 22 students, Year 2 = 18 students). These tended to reflect a more passive approach, for example: “I will continue to develop these strengths through my participation in the small groups of PBL and through my continued participation in clinical/patient care aspect of my medical education” (ID 46, Year 1). Over 1/2 of the students in Year One (n=16) and 1/3 in Year Two (n=9) said that they would make some extra effort in order to improve:

> I will review important information in books, objectives, and articles from last year before, during, and after it is applicable in the second year curriculum so that I can work toward mastering this information and connecting that information with new knowledge that I will acquire (ID 58, Year 1).

Some students (Year 1=8, Year 2 = 5) recognized the value of learning from others by planning to seek out role models, observing others they admire, and specifically seeking feedback:

> I will identify residents and attendings who are committed to lifelong learning in their respective specialties. In working with them, I hope to identify the characteristics in them that helps them to succeed. Learning from them will help me develop my strengths as I enter the medical profession (ID 39, Year 2).

Some students (Year 1= 3, Year 2 = 5) specifically planned to build time to reflect on past experiences:

> I feel that constant self-evaluation and reflection will help me evaluate how I meet these aforementioned values and analyze how I can further stay true to these values. I expect to constantly improve these characteristics by realizing that there is something to be learned in every situation (good or bad) and from every individual (ID 14, Year 2).

Almost 1/4 of the students (n=7) in their second year said that in order to improve they would attend to issues of motivation, beliefs, and values:

> I'm excited to begin a new phase of my learning. Seeing patients will inspire me to work hard. I will really want to master the information so that I provide knowledgeable, effective care. I'm excited to learn through practical experience as well; real life examples seem to help me reinforce my knowledge of a subject (ID 79, Year 2).

The patient centered care qualities that students would like others to identify remained relatively stable across the two years studied. The top three qualities in both years included being compassionate, caring and empathetic; being respectful of patients and their preferences, and being a skilled communicator. Table 9 shows the top five Patient Centered qualities for which students wanted to be known.

Table 9: *Top Five Patient Centered Care Qualities Students Want Patients to Recognize*

Year 1 # of Students	*Year 2 # of Students*	*PCC Quality*
19	13	Compassionate: caring, empathetic, helpful, pts best interests
13	15	Respectful of Patients and Their Preferences including Shared Decision-making
13	13	Communication including Listening
11	11	Trustworthy/Honest
9	7	Competence/Knowledge
7	3	Patient- take time to be with and hear patients
5	7	Approachable, Available
5	3	Relate to patients as people/whole person
5	0	Dedication
2	5	Patient Advocate

Compassion did drop from first to second place in Year Two replaced by respect. In Year One almost 2/3 of the students wanted to be perceived as caring and compassionate while only 13 mentioned this quality in their second year. About a third wanted to be recognized as trustworthy and honest. One quarter in Year Two and one third in Year One wanted to be recognized by patients as being competent and knowledgeable. Fewer students in Year Two thought it was

important for patients to feel the student is willing to take the time needed to hear their concerns.

Levels of Mindfulness

Each student's reflective narratives from the first 2 years of study were analyzed by assigning an overall level as well as individual question level based on Epstein's (1999) Levels of Mindfulness summarized below (See Appendix H for a detailed description):

0) Denial & Externalization—Sees the problem as "out there". May avoid responsibility or reflection.
1) Imitation/Behavioral Modeling— Takes some responsibility, uses external behavioral standard to resolve situation.
2) Curiosity/Cognitive Understanding—Makes decisions based on cognitive models. Reflects to generate hypotheses but ignores personal knowledge, tacit knowledge, and emotions.
3) Curiosity/Emotions & Attitudes—Shows curiosity about feelings, thoughts, and behaviors without labeling them as good or bad.
4) Insight—Shows three facets of understanding including the nature of the problem, how to attempt to solve, interconnectedness of practitioner and knowledge.
5) Generalization/Incorporation and Presence— Uses insight to generalize. Incorporates new behaviors and attitudes, shows compassion.

Only one student was assigned a Mindfulness Level 0: Denial and Externalization for answers to their reflection questions. For both years, Level 2 Curiosity: Cognitive Understanding was the Level of Mindfulness most often seen in student reflections. Table 10 shows the number of student reflections coded at each Level of Mindfulness for each question and overall rating for the two years analyzed. The bold numbers indicate the most frequent coding for each question.

Table 10: Number of Student Reflections Coded at Each Level of Mindfulness by Year

	Question 1		**Question 2**		**Question 3**		**Question 4**		**Question 5**		**Overall**	
	Year		Year		Year		Year		Year		Year	
Level	1	2	1	2	1	2	1	2	1	2	1	2
0	0	0	1	0	0	0	0	0	0	N/A	0	0
1	4	4	4	3	5	4	5	3	**21**	N/A	5	1
2	1	6	**22**	**18**	**21**	**19**	**24**	**21**	4	N/A	**20**	**20**
3	7	3	0	1	2	4	0	3	1	N/A	1	2
4	**10**	4	3	5	1	2	1	2	4	N/A	4	6
5	8	**12**	0	2	1	0	0	0	0	N/A	0	0

Students wrote between 155 – 2289 words to answer the four reflection questions common to both years. The average word count was 619 with a median of 546. Table 11 shows the Levels of Reflection assigned in Year 2 by the number of words in the student's entry.

Table 11: *Word Counts by Overall Mindfulness Level in Year 2*

	Levels				
Word Counts	1	2	3	4	5
Low: 155-447	1	9	--	--	--
Middle: 461-614	--	6	1	2	--
Highest: 657-2289	--	5	1	4	--

No one writing between 155-447 words was assigned higher than a Level 2. Five who wrote longer entries were at Level 3 or 4 compared to three at the middle level.

Question Analysis

Question One: Patient Centered Care

This question asked students to consider what patient centered care qualities that he/she would want a patient to identify in him or her over the next year. The widest distribution of students across levels was seen for this question. The higher levels (4- Insight and Generalization, 5- Incorporation and Presence) were most frequently seen. Students receiving a Level One (Imitation-Behavior Modeling) simply listed patient centered qualities or repeated phrases from the written standard:

> I feel that it is important for health care providers to be able to communicate with patients and their families as both a professional and as another human being. I hope that patients and other members of the team will see that I can communicate with patients with a caring attitude and competence (ID 39, Year 2)

> The qualities haven't changed much from last year. I'd hope that people I'm working with and caring for have a strong sense of trust in me. That kind of trust can only be earned by exhibiting all of the medical student graduation competencies (ID 23, Year 2).

Students demonstrating Level Two (Curiosity- Cognitive Understanding) in their reflection on patient centered care tended to take some responsibility, and show some awareness of issues but did not relate experiences or how these would help solve problems. For example one student showed awareness about the give and take in patient/doctor relationship: "I feel without honesty, the doctor/patient relationship has no ground to stand on and can benefit neither the doctor not the patient. Respect is a crucial aspect of patient centered care," (ID 37, Year 2) but the student never relates this to any experience or future practice. The student does not take this beyond what he/she has learned in class. Another student relies on jargon but does not express what these things actually mean for him or her:

> While I believe that experience in the medical field can develop the subtle ways of expressing compassion; I also feel that this characteristic can and should be apparent to patients. For these reasons, beneficent compassion is a key quality I hope others see in me (ID 78, Year 2).

Reflections coded at Mindfulness Level Three (Curiosity- Emotions & Attitudes) focus both on the student's own and their patients' inner life, passions, feelings and motivations:

> My primary reason for going to medical school is that I truly love to help patients. This passion began when I worked in a hospital for a number of years. I love the feeling of having a patient realize that I am truly compassionate. (ID 50, Year 2)

> Respect: This value is still number one on my list not only because I think it is very important, but also because has the potential to change the other components of the patient's care. I have to respect a patient in order to find out how to center his or her care by knowing what's important to him/her. (ID 50, Year 2)
>
> Attention to detail: I hope that as we begin caring for patients on the wards, I will be able to be calm and methodical so that my patients' care will not suffer from my own nervous dealings with new and overwhelming details. I hope amidst deciphering a multitude of lab values and admitting a new patient, I can remember to follow up on another patient's complaint or request. I think being an active listener to my patients will help me keep my focus on patient centered care. Paying attention to my their specific requests, dealing with the problems they consider most troubling, and probing the psychosocial issues that are sometimes considered too time-consuming will all help me deliver care focused on the needs I perceive and the needs the patient perceives. (ID 79, Year 2)

For Mindfulness Level Four (Insight), rather than simply listing qualities or repeating verbiage from the standard, students identified a problem and solution when discussing the patient centered qualities they would like others to recognize in them. Sometimes that problem is implied but the solution is stated. Below the student implies that getting information is important to practice and the solution is to be a good listener:

> I also want to be a good listener, both to patients and colleagues, because it is important that patients know that I hear their stories and concerns. I think patients will tell me a lot if I just let them talk and listen. It is also important to listen to other healthcare professionals because they have more experience than I do and they can teach me a lot (ID 4, Year 2).

Another student identifies the problem that physicians fail to listen to patients and the solution:

> I want them to be able to say that I always took seriously the patient’s request and preferences and made sure to always keep them in consideration when making decisions. Also, I would want the patients to be able to say that I was a good listener. . . . I feel sometimes what gets lost in medicine is the “art of listening.” Often times, patients just want

> someone to hear their story, and I pride myself with the ability to just listen (ID 46, Year 1).

For Level Five (Generalization, Incorporation, and Presence) students took their discussion of problems and solutions a step further by discussing intentions to use what they had learned in the future. Below, two answers for two students are annotated to indicate the problem, solution and plans for future use:

Student (ID 52, Year 2)

> Problem- I want to be the physician who doesn't seem hurried despite the time constraints. . . . After I completed my (rural clinical experience) this summer, I realized because of various reasons such as time constraint and non-compliant patients physicians often lose their patience and fall prey to biases.
>
> Solution- I would like to remove the imposing or judgmental aspect of the physician-patient relationship. I want them to be as comfortable and be as honest with me as possible.
>
> Plans for future use- As part of the future team of health care workers, I would like to minimize this as much as possible

Student (ID 74, Year 2)

> Problem- Oftentimes the most worrisome thing for a person is the unknown. And having questions about your health and what is being done to treat you that go unanswered, can add more stress to a stressful situation. Attending physicians and residents are far busier than medical students and have less time to spend with patients than we do.
>
> Solution- By being available to the patient and their family, I hope to be able to answer questions and allay any fears they may have regarding the disease process and treatment. This would help me to build a relationship with the patient and hopefully let them feel like they have an advocate.
>
> Plans for future use- Next year I want to be available to the patient and his family.

Question 2: Current Strengths

This question asks students to identify their strengths in relation to the graduating medical student key characteristics. For both years, Level Two (Curiosity- Cognitive Understanding) was most often assigned for this question. Students who received level one basically just listed their strengths: “I feel like I am a good communicator, and I hope that I can continue to work effectively with others on my healthcare team in the coming year” (ID 39, Year 2). Level Two students used buzz words learned in class “I tried to listen to them actively”, looked for formulas for good practice, and mentioned experiences without relating to practice. These students focused on information transfer as the primary answer:

> Currently, the strengths I see in myself are good critical thinking and problem solving skills, knowledge in biomedical sciences, evidence based practice, and societal and cultural issues, and commitment to life-long learning. I exhibit these strengths every day as I study to acquire the knowledge and skills that will help me to become an excellent physician in the future. The first two years of the medical school curriculum are designed to help students build a fund of basic knowledge of biomedical science, as well as cultural issues which can be built upon in the clinical years. I have worked hard to acquire the basic knowledge I will need to learn clinical skills in the coming years (ID 61, Year 2).

Rather than simply listing strengths or relating their strengths to having the right knowledge, students receiving a Level Three (Curiosity- Emotions and Attitudes), incorporate discussion of the inner life of themselves or their patients. For example, this student recognizes how strengths relate to how he/she feels:

> Able to collaborate. I feel energized when I work in groups, rather than feeling burdened by working with other people. I can get along with a variety of personality types, and enjoy group interaction. Committed to life-long learning and information mastery. . . . I have decided to spend an

> extra year doing a basic science experience. I decided not to be in a rush to get through medical school, but to learn as much as I can by doing a fellowship year, even though it will cause me to graduate one year later (ID 45, Year 2).

At Level Four (Insight), students' writing demonstrates insight about the nature of a problem and how one may attempt to solve it:

> A couple of my strengths right now are "Able to communicate with patients and others" and "Able to deliver effective patient centered care". I feel that these two are closely related. An example I can give came from when I was doing an interview with a patient who had recently been diagnosed with a biliary tract/ gallbladder mass and it was causing him to have pancreatic effects. His doctor came in and talked to him and let him know he was about to be discharged while I was interviewing him. After the doctor left, I continued to build a rapport with the patient and by the end of the interview, the patient felt comfortable enough to ask me questions that he'd apparently felt uncomfortable asking other doctors. Or perhaps they didn't make the time to for him to ask. Either way, he told me he did not know how a gallbladder problem could be hurting his pancreas. He'd been in the hospital for 5 days, and until that moment, no one had told him (or at least in a way he could understand) what exactly was wrong with him. So prior to his discharge I was able to give him a small anatomy lesson and he was very grateful for it (ID 70, Year 2).

This student identified a problem that the patient did not fully understand his medical condition and had not felt comfortable asking clarifying questions. His solution was to build rapport. At Level Five (Generalization, Incorporation and Presence), this next student relates what was learned from a personal experience with an illness and how this learning will be used in future practice:

> During this year, I was diagnosed and treated for a very serious condition, and realized the importance of having a compassionate medical team that takes the time to explain the process and progression of medical care to both the patient and the family at a level that is accessible. Although I often understood what my providers were telling me about tests and prognosis, members of my family were often lost in the medical dialect. This experience will provide a constant reminder for me to communicate at the level of the patient's understanding (ID 65, Year 2).

This student uses the insight gained to plan for similar challenges in the future.

Question 3: Developing Strengths

This question asked students to describe how he or she will continue to further develop their strengths. A few students received a Level One (Imitation-Behavioral Modeling) for this question. Those receiving Level One, appeared to make little effort to answer this question. In addition some showed incomplete understanding. For example, this student seems most concerned with getting their own motivations known rather than learning the patient's perspective:

> I will continue to develop these strengths through my participation in clinical/patient care aspect of my third year clerkships. I will maintain my active engagement of patients in dialogues in order to let them know that I truly have their best interest in my mind (ID 46, Year 2).

Most students received a Level Two (Curiosity- Cognitive Understanding) for this question. At Level Two, students focus on gaining skills: "I am going to keep honing my skill of being able to connect with patients and work hard at developing the skills I need to work on" (ID 52, Year 1). At Level Two, students show curiosity but do not relate this to practice:

> Right now, the strengths I lack are due to lack of experience with patients. I don't think it is possible to learn to communicate well with patients through classroom learning. As I get more experience, I think that skills such as communicating with patients, collaborating with patients and other members of the health care team, and delivering patient centered care will improve. I plan to utilize every opportunity over the next 2 years to work with patients and learn from physicians and improve my skills (ID 61, Year 2).

This student, at Level Three (Curiosity- Emotions and Attitudes) shows curiosity about others feelings thoughts and behaviors and is looking forward to learning

from others experience:

> I look forward to collaborating with residents, attendings, nurses, technicians, social workers, RTs, PTs, OTs, etc. Many of these individuals will have much to teach me and I am excited to learn from their experience. I will be mindful of each member's contributions and how they impact the overall patient-care (ID 79, Year 2).

Another student, also at Level Three shows curiosity and motivation to learn when talking about strengthening his/her commitment to life-long learning and information mastery:

> I'm excited to begin a new phase of my learning. Seeing patients will inspire me to work hard. I will really want to master the information so that I provide knowledgeable, effective care. I'm excited to learn through practical experience as well; real life examples seem to help me reinforce my knowledge of a subject (ID 79, Year 2).

Very few students received a Level Four (Insight) for this question. At Level Four, this student makes a connection between practitioner and knowledge and between their inner life but does not really have a plan for how to overcome challenges in the future:

> I will try to keep open communication going between my patients and the other members of the health care team. I am pretty shy, so I really have to work hard on talking to people and communicating well with them. I will continue to read journals throughout my career to help with my life-long learning (ID 42, Year 2).

For this student at Level Five (Generalization, Incorporation, and Presence) the problem is implied (not being present/aware of environment) but he/she shows understanding between the self as practitioner and the knowledge possessed and how this understanding can be used in the future:

> I believe it is important to remember to be conscious, aware, and mindful always of the environment surrounding me and by my own actions and own reactions to the changes occurring around me. For me personally,

> meditating on the present moment and doing everything in my life to remain healthy and happy are integral to my ability to best serve my future patients with patience, kindness, compassion, and empathy. I also think it is very important to further develop my strengths by becoming more socially and politically active and recognizing the greater role that physicians can serve in society with respect to social justice and healthcare reform (ID 102, Year 1).

Question 4: Extra Attention.

This question asked students which of the graduating medical student key characteristics will need his/her attention over the next year. A few students received a Level One (Imitation: Behavioral Modeling) for this question—appearing to make little effort to actually reflect or make a plan for learning: "As an upcoming second year student, with fairly limited patient experience I know that I need to pay extra attention to my abilities to deliver patient centered care and to collaborate with patients and other members of the health care team" (ID37, Year 1). At Level Two (Curiosity- Cognitive Understanding) students assume explicit models guide physicians' behavior. These students concentrate on learning skills and gaining specific information: "I want to be able to apply what I have already learned in these past two years as I develop proper assessments and plans for each patient. . . . I will pay careful attention to keeping my patients safe by practices like diligently washing my hands and following other proper safety procedures" (ID 4, Year 2). At Level Three (Curiosity-Emotions and Attitudes) students include issues of emotion, inner life and attitudes when talking about the things they need to work on in upcoming year such as the following student:

> Able to deliver effective patient centered care— This characteristic will need extra attention because it will be easy to get into the mindset that I

> need to do well on clerkships to meet my own goals rather than doing well because it means the healthcare team is providing better care. As the low man on the totem pole, it might be easy to become jaded and think that what I do might not matter much. It will require extra attention to keep in mind why I wanted and still want to be a doctor and to reassure myself that I can play a major role in providing patient centered care even as a medical student (ID 58, Year 2).

The student anticipates aspects of the upcoming year that may be emotionally or psychologically challenging. The next student is concerned about knowledge but discusses his/her own frustrations rather than simply looking to stockpile the cognitive tools of doctoring:

> As usual, I am struggling with "Knowledgeable in biomedical sciences, evidence-based practice, and societal and cultural issues" and "Committed to life-long learning and information mastery" if for no other reason than I find the task of learning all this information extremely daunting. I love learning and have a deep desire to know "everything" and am constantly working towards that goal. Even working as hard as I can though, I fall short of my peers and the ultimate goal of mastering this information. I know I am still young and have a long ways to go and am not expected to be a doctor today, but it is probably the most frustrating of the key characteristics for me (ID 70, Year 2).

This student at Level Four (Insight) relates their question to personal experience, connects his/her knowledge with practice but does not discuss how this insight could be used in the future:

> I feel that when I was out interacting with patients, my knowledge was quite limited and a few times I was asked questions I did not have answers to. However, after completing my second year and after studying for the boards I hope that this gap shall be reduced. However, I did face cultural issues. When I was shadowing a pediatrician we interacted with an Indian family that got fired from three practices and this physician was having a lot of trouble with them too. However when I interacted with them, given my own immigrant experience I realized that they were just undergoing cultural assimilation and often times there was misunderstanding. I thought that by giving this insight to the physician I was helpful in relieving some of the strain in the physician-patient relationship (ID52, Year1).

No student responses to Question Four were coded at Level Five: (Generalization, Incorporation, and Presence).

Question 5: Professionalism

This question asked students to describe how professionalism relates to the graduating medical student key characteristics. More than two-thirds of all students received a Mindfulness Level One (Imitation- Behavioral Modeling). Question 5 was only administered in Year One, so there was no level to compare for year two. As with other questions, student responses coded Level One (Imitation- Behavioral Modeling) were typically very short. For example, this answer showed no real attempt to connect this information with his/her own practice: “Professionalism is pretty much the back bone of all of the key characteristics. All of them deal with aspects of professionalism, not only in regard to contact with the patients, but also in contact with other health providers and continuing the professionalism by always learning new things about our trade” (ID89, Year 1). At Level Two (Curiosity- Cognitive Understanding) this student does take responsibility and show concern for future patients and implies a problem (not being prepared) but the solution and relation to practice is not well articulated:

> Professionalism denotes a person academically and personally prepared for their work. I hope to have achieved this goal before I get into practice. It would be unfair for my patient's if I were not prepared for my job and if I did not convey this to my patients through my actions and attitude. Professionalism requires that the practitioner strives for excellence in all of the goals set forth in the graduating medical student competencies - including knowledge in biomedical sciences; respect for my patients, my peers and staff, and myself; a commitment to lifelong learning;

> accountability for my actions; and to conduct myself with honor, honesty, and integrity (ID98, Year 1).

At Level Three (Curiosity- Emotions and Attitudes) this student strongly connects professionalism with reflection on one's own beliefs and attitudes:

> Striving to embody the greatest values in our profession must begin with introspective exercises such as this one. Without reflection, one's professional performance may vacillate with the unique demands of each day. It is through an intentional commitment to equal and high-quality care that we can consistently provide the highest level of care to our patients (ID9, Year 1).

At Level Four (Insight), the next student shows an understanding of the interconnectedness between the practitioner and the knowledge possessed and the way patients define professionalism:

> I think professionalism is very closely related to the Graduation Characteristics. When a patient thinks of a professional, the first and most important thing that comes to mind is the first key characteristic: "Able to deliver effective patient centered care." In order to have this ability, several of the other key characteristics are inherently necessary, and thus play an important role in being a professional. . . .If a physician has all of these qualities and is able to deliver effective patient centered care, he has some basic level of professionalism. What really separates the good physicians from the great however is to what degree they have mastered the above qualities, and the presence of "honesty and high ethical standards." Being able to admit to patients when mistakes have been made, to make sound ethical decisions upholding the patients autonomy even when difficult, and to always put the patient and their health before the benefit of the physician are examples of what make a great physician and are key to professionalism (ID70, Year 1).

No responses to this question were coded at Level 5 (Generalization, Incorporation, and Presence).

Changes from Year 1 to Year 2

For all questions, half or more of the responses received the same Level of Mindfulness in Year Two as in Year One. For Questions 3 and 4 (how to further develop strengths and which competencies need attention) more than two-thirds of the ratings remained the same.

Table 12: *Changes in Level from First to Second Year Reflections*

	Question 1	*Question 2*	*Question 3*	*Question 4*	*Question 5*	*Overall*
Lower	7	4	2	1	NA	4
Higher	8	10	5	7	NA	11
Same	15	15	22	21	NA	14

Although on individual questions, many of the Mindfulness Levels did not change, only three students' reflections were rated at the exact same reflection level for all questions across both years. Students had from 0-4 changes in Level from Year 1 to Year 2. Table 12 shows how many students had each number of changes and whether these changes were all to higher levels, lower levels, or mixed.

Table 13: Number of Changes in Level from First Year to Second Year Reflections

# of Changes	*# of Students*	*All Changes Lower than year one*	*All Changes Higher than year one*	*Both Higher and Lower Changes*
NA	1	NA	NA	NA
0	3	NA	NA	NA
1	6	2	4	NA
2	11	1	8	2
3	5	1	1	3
4	4	1	2	1
Total	**30**	**5**	**15**	**6**

Six students had a change in level for one question: two received lower and four received higher reflection levels. Eleven students had changes for two questions most of which were higher than the previous year. Five students had changes in level for three questions with three of the five receiving both higher and lower levels in the second year compared to the first. Four students had a change in level for four questions: one with all lower levels than the previous year, two with all higher, and one student with mixed higher and lower levels. Half of the students received the same or higher Levels in the second year. Five received the same or lower levels in Year 2. Six students received both higher and lower Levels of Mindfulness for their responses to reflection questions.

Comparison of Reflection Responses Across Year One and Year Two

These reflections were initially coded without referencing the previous year and levels were assigned based on the definitions of level of mindfulness, but this did not take into account effort or subtle shifts in wording. So I used the compare and merge function in Microsoft Word to put the Year 1 and Year 2 reflections together in one document that indicated by underline what was added in Year 2 and noted which words were deleted from Year 1. A word count determined what percentage of the Year 2 entries were copied from Year 1. This is detailed in Table 14. Year 2 answers had between 0-99% of content copied from Year 1. In extreme cases, the student simply changed the tense but otherwise left the answer the same. Many students either built on or revised their answers based on new experiences.

Table 14: *Number of Students by Percentage of Year 2 Entry Copied from Year 1*

% Copied	*# Students*
0-20%	14
21-40%	3
41-60%	6
61-80%	2
81-100%	4

By looking across years, I was able to determine if students added substantial content or simply changed a few words in order to meet the requirement. Comparing across years, I noted that five students provided much shorter answers in Year 2 than they had in Year 1. Two students resubmitted Year 1 entries after only minor changes to spelling and tense. Seven others had unchanged responses for at least one of the reflection questions. Two students kept most of their response from Year 1 but did add content. Four students provided responses that did not meaningfully answer how they would further develop their strengths.

For example, one student shows little evidence of thinking about how he/she will further develop strengths. In Year 1 the student says: “I will continue to make the most out of PBL group sessions so that my critical thinking, and interpersonal skills can continue to improve” and in Year 2: “I will continue to develop my knowledge base and problem solving skills as I apply this knowledge in my clinical rotations and shelf exams” (ID70, Q3). The student essentially says that he or she will participate in the curriculum in order to develop these competencies. Other students appear to have spent more time as evidenced by longer and more detailed responses.

Themes Emerging from Comparison

Comparing reflections across years allowed me to identify shifts in thinking that could not be discerned when only using Levels of Mindfulness and only looking at a single year. These following themes were noted (a) self assessment of competency, (b) a shift to a more practice oriented concerns, (c) motivation

and lifelong learning, (d) patient/physician relationship, (e) ethics, and (f) the intersection of outside roles with the role of medical student. In comparing the two years, it was not only what a student added to content but also what was deleted that provided information about shifts in thinking. These themes are discussed below. It should be noted that identifying elements of representative quotes illustrating themes have been changed to protect anonymity but the overall meaning of the statements was retained.

Self Assessment

Twelve students added an element of self assessment not seen in their Year 1 reflections. These students noted both areas of improvement and concerns/limitations. For example in Year 1, a student considers critical thinking and problem solving to be a strength and in Year 2 adds the element of creativity "Solving difficult problems often requires creativity and a different perspective. I try to use my creativity to solve such problems rather than just find the facts," (ID6, Q2, Year 2). The addition of creativity seems to show maturation in the student's understanding of him/herself. Other students recognized improvement to specific skills:

> I've improved in my skills on knowing when exactly to order what tests which previously was something I struggled with especially in terms of radiology and when CT versus ultrasound was appropriate especially in situations in which you knew you were going to have to get a CT anyway, and it seemed almost like a waste of money to do x-ray first. I feel much more confident in understanding all the different aspects that definitely come into play (i.e. radiocontrast CI, rural hospital, etc.) (ID102, Q1, Year 2).
>
> After completing the pathology of organ systems and having more experience with patients, I feel confident enough to put (patient centered care) as a strength! I am able to "graduate" to this level of confidence because of tutor evaluations, peer comments and the physical diagnosis

> program coordinators having faith in my abilities and my own feeling of satisfactory encounters with patients (ID52, Q2, Year2).

Some entries speak to fears. This student describes how he or she developed an understanding of him/herself that helped guide a career choice. The student also speaks about the intersection of his/her concern with quality and safety, an understanding of personal characteristics and limitations, and choice of career:

> It has always been my lifelong dreaded fear to do harm to a patient and perhaps even injure or kill a patient by a single careless mistake. I found myself doubting my presence in medicine when I was forgetful. Each time I misplaced something or realized I forgot something in my daily life, I was terrified at the possibility I could do such a thing in my career. What I've come to realize is that yes obviously I need to be more vigilant and be as conscientious and careful as possible in my medical practice. However, I've always come to realize that I shouldn't choose a career like emergency medicine or surgery where yes, those kind of mistakes could be devastating and that my personality and my skillset as a physician is more geared toward making decisions which involve the patient's conscious input (ID102, Q1, Year 2).

Students also express concerns about personal challenges or weaknesses. The student expresses concern about letting his/her own shortcomings interfere with patient's experience:

> I hope that as we begin caring for patients on the wards, I will be able to be calm and methodical so that my patients' care will not suffer from my own nervous dealings with new and overwhelming details. I hope amidst deciphering a multitude of lab values and admitting a new patient, I can remember to follow up on another patient's complaint or request. I think being an active listener to my patients will help me keep my focus on patient centered care (ID79, Q1, Year 2).

This student mentions struggling with the knowledge base in both years:

> Even working as hard as I can though, I fall short of my peers and the ultimate goal of mastering this information. I know I am still young and have a long ways to go and am not expected to be a doctor today, but it is

> probably the most frustrating of the key characteristics for me (ID70, Q4, Year 2).

This student articulates a plan to further develop strengths by reading journals, listening to peers, and studying, but adds a self assessment aspect to Year 2 reflection:

> I will try to keep open communication going between my patients and the other members of the health care team. I am pretty shy, so I really have to work hard on talking to people and communicating well with them (ID42, Q3, Year2).

Some answers were notable for their lack of self assessment. For example one student (ID23) mentions strengths that tutors have identified but does not comment on his/her own opinion about personal strengths. Another student removed a comment from Year 1 to Year 2 about having a "long way to go to get comfortable with medical communication" (ID45, Q2, Year 1) possibly indicating greater comfort in this area.

Shift to Focus on Practice

Five students indicate values related to practice but did not make substantial additions or changes from one year to the next that could imply some growth in thinking. These values include respect for patients, honesty, ethical behavior, treating the patient not just the disease, standing by one's beliefs, and the importance of minimizing bias. More than one third of the students showed some degree of shift in focus toward practice. For example, one student changed from communication and medical knowledge to learning to collaborate with other members of the healthcare team (ID71). In year 2, one student acknowledges

that working in the hospital and with other members of the healthcare team will need extra attention in the next year and that “Interacting in this environment day-in and day-out will be different than the classroom interactions that I am accustomed to” but does not provide any detail about how these interactions may be different (ID60, Q2, Year 2).

A couple of students specifically mention learning from other health care providers. One student plans to specifically look for the formula for success: “I will identify residents and attendings who are committed to lifelong learning in their respective specialties. In working with them, I hope to identify the characteristics in them that helps them to succeed. Learning from them will help me develop my strengths as I enter the medical profession” (ID39, Q3, Year 2). Given that these students were getting ready to start the clinical portion of their education it is interesting that in Year 2 entries one student deleted learning from others as a way to continue to develop strengths (ID60).

Although one student mentioned wanting to learn to integrate patient centered care and critical thinking in Year 1 and then dropped this in Year 2 (ID89), this was not the general direction of student entries. Several students show a shift in focus to more practice oriented concerns. For example, for one student there is a qualitative difference in the way the student talks about strengths from Year 1 to Year 2. In Year 1, the student relates the competencies directly to what he/she is doing in medical school:

> Critical thinking is vital for the profession of medicine, but also in everyday life. I have used my skills not only in the PBL cases and exams, but also in my objectives. With a combination of creativity and critical thinking, I endeavor to create new and better ways to present and retain the

> information in my objectives. . . Honesty was very important to my family and in our profession. Honesty and ethics go hand-in-hand and are extremely important for trust. With my objectives, I feel it very important to clearly label the sources so anyone can get to the information. And anytime I find any errors in any of my objectives, I inform my group members (ID74, Q2, Year 1)

In Year Two, the student provides examples of challenges and ways that he/she has applied these to larger life and how larger life applies to these characteristics:

> I feel my strengths are the same. My honesty/ethics have been challenged by what is easiest and what is right. For example, one of the physical diagnosis program preceptors gave me patient records. I held onto those records for close to a month in my desk, locked away, until I had a chance to put them in the shred box. This kept those patients' information secure. My critical thinking skills have mostly been applied to logistics. Over the past year I have been in charge of two major school events. . . . Both events required that I gather, plan, and set up everything so that they could be executed well and so everyone could enjoy them. Lastly I am committed to lifelong learning, not just of medicine, but in other things, too. The previous summer I spent abroad doing research, traveling, and learning another language. Another thing that I do is read. I read classic literature as a way of exploring new worlds and looking at life through others' eyes (ID74, Q2, Year 2).

Students also anticipate challenges in the upcoming year. One student is concerned with learning to communicate with patients "of all different backgrounds, cultures, education levels, and healthcare qualities. I hope that I will be able to focus on practicing effective communication and ways of describing concepts. I also hope to learn to think critically in real-time" (ID41, Q3, Year 2). The student's entry shows concern with practice and seems to show some understanding of the ways in which what he/she is doing now as a student relates to but is not the same as what he/she will do in practice. Another student was concerned with expanding knowledge and patient centered care qualities in

Year One, but in Year Two the student is anticipating how he/she may handle difficult situations in the upcoming year:

> One of the core characteristics is dedication to improving the safety of care. I think this point will need extra attention because at this point, it seems a bit daunting to approach a member of the healthcare team with my experience than myself and tell them that I think they have made a mistake. Nevertheless, I am convinced that for the safety of the patient, it is the right course of action. I plan on keeping the safety of the patient in mind to develop the necessary courage needed to confront a superior. I know that many members of the healthcare team will appreciate the effort, but it is a personal hurdle that I hope to overcome during the course of my third year (ID81, Q4).

In addition to challenges, some students start identifying practice problems and looking for solutions:

> My communication with patients is still nowhere near where I'd like it to be. It seems that it won't take me too long from now to learn how to fly through a list of predefined medical questions during and history and physical. A lot of the good stuff, though, is everything that you can't get from those questions. Right now I'm only getting to that place with a few of the patients I've seen. I'd like to get there with them all eventually. Of course, I also know that's impossible (ID23, Q4, Year 2).

Although this student is still focused on knowledge, he/she has begun to figure out that simply applying tools may not be enough to gather all the information needed to treat patients. This is a lesson gleaned from experience.

Motivation and Lifelong Learning

In Year 2, several students discuss their motivations for continued learning. One student added patient centered care as an area to work on and considers how experiences may negatively influence his/her views in the future:

> Able to deliver effective patient centered care . . . will need extra attention because it will be easy to get into the mindset that I need to do well on clerkships to meet my own goals rather than doing well because it means the healthcare team is providing better care. As the low man on the totem

> pole, it might be easy to become jaded and think that what I do might not matter much. It will require extra attention to keep in mind why I wanted and still want to be a doctor and to reassure myself that I can play a major role in providing patient centered care even as a medical student (ID58, Q4, Year 2).

Another showed a new understanding of lifelong learning and spoke to motivation for continuing to build knowledge:

> my clinical rotations will give me an opportunity to apply this knowledge in a “hands on” fashion to help better patients. Of course, navigating the wards in no way means I am done learning. In fact, I anticipate having a name, a face, and a future on the line will make outside reading and study that much more interesting and rewarding (ID9, Q4, Year2)

Rather than simply building discrete bits of knowledge, some students demonstrated a shift to thinking about the lifelong nature of their learning and the relationship of their learning and practice. The example below shows the student’s responses for both years. In Year 1 the student has a narrow focus on obtaining knowledge and experience: “I feel that there is so much that I still need to learn. My next year will be focused on learning more about disease processes and obtaining more clinical experience” which shifts in Year Two to a more long term perspective: “I feel these characteristics are something that I will work towards until the day I retire. It is important for me that I not only reach these goals but excel at them. Realizing that I can always improve on these characteristics will allow me to always keep them at the surface of my mind” (ID14, Q4). Another student comments on limitations and motivations for knowledge acquisition and ties it to their care of patients “The more I learn, the more I realize how little I know. This motivates me to continue to expand my

knowledge. I am also beginning to realize how I can do for my patients when I know more. That motivates me to continue to learn" (ID34, Q3, Year2).

Patient/Physician Relationship

About two-thirds of the students' reflections indicated some change in their views about their relationship with patients. Although many of the changes in students' views about their relationship with patients were discerned through additions or complete replacement of the previous year's text, changes in thought were also implied by small deletions that students made. Most of these deletions were words and concepts that indicate the softer side of the patient/physician relationship (i.e.- feelings, empathy, understanding). The following illustrates changes one student made to the patient centered care qualities he/she would like others to recognize in them:

> It's important to me that the patient and his/her family realizes that I am here for them, that addressing their ~~wishes and~~ concerns are my top priorities. I do not merely want to treat the patient as a problem that needs a solution, but rather a complicated human being that needs my help in getting better (ID81, Q1, Q1, Year 1 and Year 2 with strikeout indicating words left out of Year 2).

The student has deleted addressing patient wishes from his or her top priorities. The following sections outline shifts in understanding the relationship as a partnership, acknowledging what the student receives in the relationship (reciprocity), the inclusion of an element of time in considering how a physician might interact with a patient, discussion of the students' new role in clinical years, and the importance of communication to the patient-physician relationship.

Partnership. Comparison across both years showed a shift in some students' thinking about their partnership with their patients. For example one

student expresses concern for the “whole person” across both years but drops verbiage about “working together” from Year One and refers instead to working “with patients and families to find treatment options and lifestyle changes that are appropriate for their priorities and values as well as for the medical condition” (ID41, Q2, Year2). This seems to provide more focus on the purpose of the relationship than the previous entry.

Another student removes “feeling” when discussing patient centered care qualities: “Respecting patients would hopefully give them a sense of autonomy and ~~the feeling~~ that I truly care about their wellbeing” (ID4, Q1, Year 1 and Year 2 with strikeout indicating words left out of Year 2). This may indicate a subtle shift from the impression of caring or sense of caring to genuine care.

Two students removed references of a partnership with patients. One student removes reference to wanting to communicate “in the most effective and caring way possible. I want to make decisions with my patients instead of making decisions for my patients” (ID34, Q1, Year 1). The other deletes “I want my patients to identify that my role in their health care is that of a partner and that I will listen to my patients fears and concerns” (ID14, Q1, Year1) and adds “Constantly learning from my superiors, peers, and patients will play a vital role i(n) ensuring that I build a strong foundation with the goal of delivering exceptional health care” in Year 2 (ID14, Q1, Year2). So the student has shifted focus from partnering with the patient to learning from the patient and others in order to excel at their practice. This may signal that the student is starting to have more confidence in what he/she brings to the relationship in terms of their

knowledge and that he/she is identifying more as a member of the healthcare team.

Reciprocity. In Year 2, three students who had not previously done so spoke to the reciprocal nature of the patient/physician relationship. One acknowledges that s/he gets something from the interaction: “Above all else, I want my patients and other members of the healthcare team to think of me as compassionate. The reason I entered the field of medicine was to try to make a positive impact on others' lives in a way that is both enjoyable and meaningful to me.” (ID58, Q1, Year 2). Another student reflects on his/her role in the healthcare team and the reciprocal nature of the patient/doctor relationship: “At this early stage of my career often my interactions with patients have little impact in their actual treatment, but by being honest with patients about how great of a learning opportunity my experience is with them really provides a positive experience for all involved” (ID50, Q1, Year 2). The third student also addresses learning from the patients:

> This year when I completed the physical diagnosis program, my resident served as an excellent role model for me in terms of not only knowledge but mainly his patient interactions. In a teaching hospital patients sometimes view themselves as guinea pigs. . . . respect(ing) your patient's view yet accomplishing your tasks at hand is a fine line indeed that residents walk on and a path I will be treading next year on the wards. My goal next year is to learn my utmost medically from patients and yet view the interaction also from the patient's perspective and make the interaction not only as comfortable as possible (but) such that the patient is also a beneficiary and perceives it as so (ID52, Q1, Year2).

Several students mention respecting the patients’ wishes, and one specifically acknowledges how his/her own values might influence interactions with a patient.

In Year 1 this student is concerned with bedside manner, ability to communicate, and forming close relationships with patients:

> Respect is an integral part of the physician-patient relationship. I believe important characteristics of respect include honesty, tolerance, patient advocacy, shared-decision making, patience, and care/compassion. I will be honest with my patients by providing them with accurate and up-to-date information about their diagnosis and the treatment options available. I will not let personal beliefs affect the way I present the information to my patients. I will also respect their personal beliefs and their choice for treatment (ID98, Q1, Year 2).

In year 2, the student is focused on respect and goes into detail about what this means. The student also addresses his or her own potential biases.

Time. A couple of students add an element of time when describing their relationship with patients in Year 2. For example, in both years' entries one student discusses being compassionate in order to put patients at ease, but in Year 2 the student adds the elements of time and the patient's goals in the interaction: "I will ensure patient centered care by taking time to listen to and address all of the patients' concerns" (ID6, Q1, Year 2). So the student recognizes that time will be a factor in practice and he/she must make a special effort when interacting with patients. The student has also added the patient's perspective to the relationship. The relationship is not only about the physician showing compassion but also about finding out what is important to the patient. Another student expressed concern in Year 1 that many physicians he/she had encountered were focused on diseases rather than patients. In Year 2, the student had additional experiences which slightly changed his/her perspective:

> After going through this year and listening to what a lot of the in-patients in our case wrap-ups and patient care lectures had to say, I may have changed my answer a little bit from last year. I am beginning to realize that most

> doctors legitimately care, are competent practitioners, and fulfill patients' needs as they become aware of them. But one of the things that really sets apart doctors that are focused on patient centered care from those who don't is the ability and patience to make the time to sit with a patient and answer their questions. The best thing those in-patients had to say was about the residents and third years on their clinical team who took the time to sit down and give comfort and answer questions when the clinicians didn't make the time. I'd like to be committed to this: Making the time to talk to the patient and be there when they need you, not just when it is time for you to be "working" on them" (ID70, Q1, Year 2).

New roles. Some students wrote specifically about their role as student on the healthcare team. One student wrote in both years about wanting patients to know he/she is concerned with their physical and emotional wellbeing, but in Year 2 the student seems more aware of his or her role in the healthcare team and is more concrete about the process and procedural part of the interaction: "As the individual on the team who will many times be the first to see the patient and spend an extended period with them during the interview and the physical exam, I feel that the patient centered care qualities are of the utmost importance" (ID14, Q1, Year 2). For another student, trust is a major theme in Year 1 whereas in Year 2, the student is concerned about alleviating patients' fears. This student has also identified time as being a constricting factor in the patient/physician relationship, and discusses how he/she as a student may contribute to patient care:

> Oftentimes the most worrisome thing for a person is the unknown. And having questions about your health and what is being done to treat you that go unanswered, can add more stress to a stressful situation. Attending physicians and residents are far busier than medical students and have less time to spend with patients than we do. By being available to the patient and their family, I hope to be able to answer questions and allay any fears they may have regarding the disease process and treatment. This would help me to build a relationship with the patient and hopefully let them feel like they have an advocate (ID74, Q1, Year 2).

Students are considering what patient centered care means for them. One student has thought about how patient centered care applies to the laboratory setting:

> Patient centered care is important in laboratory medicine even though patients are not present. The two qualities I most want to demonstrate next year are compassion and patient advocacy. Compassion is important in laboratory medicine as much as it is in the more clinical specialties. An example is autopsy, in which it will be very important to treat family members and the deceased with respect and dignity. I would like to be a patient advocate by communicating laboratory results and recommendations clearly with clinicians so that the best possible care can be provided for each and every patient (ID45, Q1, Year 2).

Communication. Several students discuss the importance of communication in their relationship with patients and comparison of entries across two years seems to indicate that experiences in their second year changed their understanding. One student thought problem solving and honesty with high ethical standards were strengths in the first year. At year two, the student considered communication with patients and others and patient centered care to be strengths. This student relayed an example of how these two were related:

> (I was with a) patient who had recently been diagnosed with a biliary tract / gallbladder mass and it was causing him to have pancreatic effects. . . . while I was interviewing him. . . . the patient felt comfortable enough to ask me questions that he'd apparently felt uncomfortable asking other doctors. Or perhaps they didn't make the time to for him to ask. . . . He'd been in the hospital for 5 days, and until that moment, no one had told him (or at least in a way he could understand) what exactly was wrong with him. So prior to his discharge I was able to give him a small anatomy lesson and he was very grateful for it" (ID70, Q2, Year 2).

Over both years, another student wants to be seen as a good listener but in Year 2 shares "I'm learning more and more the importance of being a good talker too. I need to communicate to my patients so that they understand me." (ID34, Q1,

Year2). Another student: “I will maintain active engagement of patients in dialogues in order to let them know that I truly have their best interest in my mind” (ID46, Q3, Year 2). The student is not concerned about what he/she can learn from the patient but what the student can share. Another student is concerned with communication in both years but deletes empathy and understanding in Year 2 (ID71).

Ethics

Commitment to honesty and ethical behavior was a stable value mentioned by several students in both Year 1 and Year 2. Most students do not articulate how they might develop competence in this area other than to say they will just do it, however one student plans to “think more about my beliefs for ethical dilemmas facing physicians today, so that when I am put in a difficult situation, I will already know my beliefs and will only need to act,” (ID2, Q2, Year 1 and Year 2). In Year 2, another student provides examples of challenges and ways that he/she has applied these to larger life and how larger life applies to these characteristics:

> Not a lot has changed since last year. I feel my strengths are the same. My honesty/ethics have been challenged by what is easiest and what is right. For example, one of the physical diagnosis program preceptors gave me patient records. I held onto those records for close to a month in my desk, locked away, until I had a chance to put them in the shred box. This kept those patient's information secure. (ID74, Q2, Year 2).

Interestingly, five students removed honest and ethical from their list of strengths in the second year. Some of these students replaced this competency with more clinically focused strengths such as communication and patient

centered care. Two students added honest and ethical behavior in the second year. One of these students includes a statement of values related to what will receive attention:

> The characteristics that I believe will need extra attention next year are those characteristics that I believe are the most important for every physician to have. These include honesty and high ethical standards and the ability to deliver effective patient centered care and the ability to communicate well with patients and others (ID14, Q4).

Outside roles

Most students never addressed roles or experiences outside of that of student physician so those that did stood out. One student related how volunteer experiences helped enhance/build strengths:

> Throughout the year, I have been . . . working with high school teens to try to engage them in science and medicine has allowed me to sharpen my communication skills as well. Furthermore, during the past summer, I spent a month in an underserved country with different volunteer organizations. These experiences allowed me to gain significant understanding of international health issues, and allowed me to experience very diverse cultures. Working within a rural hospital there taught me the importance of learning to do a good physical exam, in addition to what it means to be frugal with medical supplies. I practiced cultural sensitivity first-hand and learned the importance of understanding the cultural norms and practices of my patients while treating them (ID81, Q2, Year 2).

Another discusses the intersection of outside roles and that of medical student:

> I have found that as I get older, it becomes easier to be completely honest and open when I make mistakes. As a husband and a father . . . and as a health care provider, I have a strong desire to set an example of integrity. (In order to develop communication competency) I am going to continue my community service work which requires public speaking most weekends (ID45, Q3, Year 2).

Two students discuss the importance of finding balance and remaining healthy to building competence and developing relationships with patients.

> I believe it is important to remember to be conscious, aware, and mindful always of the environment surrounding me and by my own actions and own reactions to the changes occurring around me. For me personally, meditating on the present moment and doing everything in my life to remain healthy and happy are integral to my ability to best serve my future patients with patience, kindness, compassion, and empathy (ID102, Q3, Year 1).

> I self reflect constantly. And I also balance life and medicine, making my communication skills better and (someone) who can relate to her patients at the level of a fellow human being. (As an example), I have been taking dance classes (ID52, Q3, Year 2).

One student related how a life experience influences how she will approach her own practice:

> During this year, I was diagnosed and treated for a very serious condition, and realized the importance of having a compassionate medical team that takes the time to explain the process and progression of medical care to both the patient and the family at a level that is accessible. Although I often understood what my providers were telling me about tests and prognosis, members of my family were often lost in the medical dialect. This experience will provide a constant reminder for me to communicate at the level of the patient's understanding (ID65, Q2, Year 2).

Exploring Relationships between Tutor Evaluations and Reflection Questions

This section explores the relationship between the Self Reflection scores that students receive from tutors and the Levels of Mindfulness assigned. First numerical patterns were explored then a qualitative analysis of individual students' data was completed looking for any emerging themes or patterns.

Numerical Patterns

The design of the tutor evaluation allows faculty to give students an overall rating of Unsatisfactory, Satisfactory, or Superior but also mark behavioral descriptors at either of the other levels. For example, a student may receive an

overall Satisfactory for the Self Reflection section, but have one check (a secondary rating) in the Unsatisfactory area indicating an area that needs improvement. This allows faculty to provide feedback without having to type out comments. As noted earlier, tutors almost exclusively assign ratings of Satisfactory and Superior to students' performance. The numbering system outlined below provides a finer grained comparison of student ratings. If a student received a secondary check for an item below the overall rating, s/he received a lower score. If the student received a secondary rating at a level above the overall rating, he/she received a higher score. Table 15 summarizes the usage of the ratings across the two years analyzed for the students whose reflections are analyzed in this study.

Table 15: *Assignment of Performance Level for Self Reflection*

Overall	*With a Secondary of. . .*	*Rank*	*Year 1 %*	*Year 2 %*
Unsatisfactory	None	1.0	--	--
Unsatisfactory	Satisfactory	1.1	--	--
Unsatisfactory	Superior	1.2	--	--
Unsatisfactory	Satisfactory & Superior	1.3	--	--
Satisfactory	Unsatisfactory	2.0	--	--
Satisfactory	Unsatisfactory & Superior	2.1	--	--
Satisfactory	None	2.2	75 (33.6%)	59 (35.3%)
Satisfactory	Superior	2.3	28 (12.6%)	23 (13.8%)

Superior	Unsatisfactory	3.0	--	--
Superior	Unsatisfactory & Satisfactory	3.1	--	--
Superior	Satisfactory	3.2	45 (20.2%)	20 (12.0%)
Superior	None	3.3	75 (33.6%)	65 (38.9%)

This rating was calculated across eight blocks of PBL and six blocks of the patient care course. So each student had up to 14 ratings for two years. Student means ranged from 2.38 to 3.28. As can be seen in Table 14, only 2.2, 2.3, 3.2, and 3.3 were needed because no student received an Unsatisfactory Overall or Secondary ratings for the Self Reflection section. The average for all students in Year One was 2.79 and in Year 2 was 2.76. Two-thirds to three quarters of all tutors in any block provided an overall score for the Self Reflection but did not use any secondary checkmarks to provide student feedback.

A Pearson Correlation between the students' assigned overall Level of Mindfulness and their tutor evaluation average for the year showed very weak correlation (Year 1 = .057, Year 2 = .36). No real pattern emerged when looking at the highest tutor averages. Students with tutor evaluation averages in the top half of all participants were assigned a range of Mindfulness levels from 1 to 4. However, 10 of 13 (77%) students who got a 3 or 4 on their Overall Mindfulness level also had higher tutor evaluation averages (in the top 50% of participants.)

Each individual's tutor evaluation was analyzed by first recording the number of tutors that considered the student to be Superior in the area of self

reflection and noting any comments made by the tutor. Because few tutors made comments in the Self Reflection section, I also included comments from the Overall section which was completed by 100% of all tutors for all students. This section includes an overall rating which can be Unsatisfactory or Satisfactory in Year 1. In Year 2, the person can also receive a rating of Honors.

I also noted the individual's sex. In looking at this data, I noted that more women consistently (defined as 50% or more of all blocks evaluated) received superior ratings in the area of self-reflection than did men: women (85%, 11/13), men (53% 8/15). Eleven of 30 students received Overall Mindfulness Levels at Level Three or above in one or both years. Of these, seven were women and four were men. Three women and no men received Overall Mindfulness Ratings of Level 3 (Curiosity- Emotions and Attitudes). All of the students (n=10) receiving Honors in more than half of the blocks were very concerned and curious about knowledge as demonstrated by receiving an Overall Mindfulness Level 2 (Curiosity- Cognitive Understanding) in one or both years. Two of the three women receiving Honors more than half of all blocks went down a Mindfulness Levels from Year 1 to Year 2, one stayed the same. Four of the seven men receiving Honors more than half of all blocks went up in Mindfulness Levels from Year 1 to Year 2, one went down and two stayed the same.

Qualitative Analysis

Next, I took the above information for each student and looked at it in conjunction with responses to the reflection questions in the first and second year. As noted in the numbers above, strong patterns did not emerge. What I did

notice however, was that by looking at both the tutor evaluation and the reflections together, a more complete picture of the students' experience emerged. For example, one student (ID2) was rated as Superior in self reflection by half of her tutors who also commented on this student's attention to the patient's perspective. Interestingly, the student actually removed reference to the patient's perspective in her Year 2 reflection entries. There is no way to know her motivation for doing so, but it does raise interesting questions about what motivated this student to remove something others noticed as important to her.

Another student (ID4) received ratings in the area of self reflection only 9 of 14 blocks. All other students received ratings for 12-14 blocks. This might indicate that this area was not considered a strength or weakness by some tutors. Also, this student received very positive overall comments in Year 1, but seemed to struggle in Year 2; receiving comments of concern about inattention and unawareness. This student also only earned Honors in 1/6 blocks. This provides some context to better understand the student. Similarly, another student (ID14) received glowing comments through Year 1 but less than half of the tutors thought she was Superior in self reflection. In year 2, tutors made repeated comments about the student being too quiet. In the student's reflection, she recognizes her difficulty building rapport and identifies ways in which she will continually self evaluate her interactions in order to grow. In this way, the tutor evaluation and the self reflection reinforced each other.

Another student (ID45) relates the value he places on patient centered care which is then reinforced by comments from tutors who notice the same. One

student (ID70) only received a superior in self reflection 4/12 blocks and received Honors in only one block but received one of the higher Mindfulness Levels (Level 4- Insight) on his Year 2 reflections. So the evaluations can not only support but also contradict each other. Looking at the student reflections in light of multiple tutors' evaluations of the student can reinforce the students statements as well as point out discrepancies between the student's and tutors' perceptions.

Summary

At the end of the first and second years of study students are asked a series of guided questions designed to encourage reflection upon their development as a student physician. Responses to reflection questions become part of the medical student's portfolio. These questions provide the opportunity for students to step away from action and think- particularly about the kind of doctor they would like to be and to consider their own values in relation to something external to themselves. Each student's reflective narratives from the first 2 years of study were analyzed by assigning an overall level as well as individual question level based on Epstein's (1999) Levels of Mindfulness. Only one student was assigned a Mindfulness Level 0: Denial and Externalization for answers to their reflection questions. For both years, Level 2 Curiosity: Cognitive Understanding was the Level of Mindfulness most often seen in student reflections. For one question the higher levels (4- Insight and Generalization, 5- Incorporation and Presence) were most frequently seen. This question asked students to consider what patient centered care qualities that a student would

want a patient to identify in him or her over the next year. In their answers, these students showed insight into a practice problem and solution. Those at Level 5 also generalized as to how they would solve similar problems in the future. For a question asking students to describe how professionalism relates to the graduating medical student competencies, more than two-thirds of all students received a Mindfulness Level One (Imitation- Behavioral Modeling). These students made very little effort to tie this question to their own practice.

For each question, 1/2 to 2/3 of all students' levels remained the same in Year 2. However only 3/30 students had no change to any question. The remainder of students had changes in level for at least one question. Summing all changes across questions, more than twice the changes were increases in level (n= 41) as compared to decreases in level (n= 18). Comparing reflections across years allowed me to identify shifts in thinking that could not be discerned when only using Levels of Mindfulness and only looking at a single year. These following themes were noted (a) self assessment of competency , (b) a shift to a more practice oriented concerns, (c) motivation and lifelong learning, (d) patient/physician relationship, (e) ethics, and (f) the intersection of outside roles with the role of medical student. In comparing the two years, it was not only what a student added to content but also what was deleted that provided information about shifts in thinking.

There was not a strong relationship between scores on the self reflection portion of their tutor evaluations and the mindfulness levels assigned to students responses to narratives. Students with tutor evaluation averages in the top half of

all participants were assigned a range of Mindfulness levels from 1 to 4. However, 10 of 13 (77%) students who got a 3 or 4 on their Overall Mindfulness level also had higher tutor evaluation averages (in the top 50% of participants). These two assessments of reflection can both support and contradict each other. Looking at the student reflections in light of multiple tutors' evaluations of the student can reinforce the students statements as well as point out discrepancies between the student's and tutors' perceptions.

In the next chapter, I discuss these findings in relation to the research questions that guided this study. Limitations of this study are provided. Conclusions and Implications for research and practice are also outlined.

CHAPTER 7

CONCLUSION

Now nearing the end of this journey, I am doing my own reflection on the meaning of all that I have encountered— from interviews with faculty to hours spent “listening” to what tutor evaluations and students’ reflection narratives had to “say.” I became interested in the use of reflection in medical education because I noticed the term used frequently and in ways that did not seem consistent. As I began looking into the subject further, I found that indeed reflection means many things depending on context and to whom you speak. With so many different ideas about reflection and its use in medical education, I wondered how all of these things called “reflection” had grown to be used in one setting.

In general, the medical profession values the ability to reflect and sees it as necessary to practice. Physicians deal with complex and ill-structured problems. They must be able to reflect in order to function professionally while adapting to their patients’ needs. Many medical schools incorporate “reflection” into the curriculum and student assessments, but with so many definitions and interpretations, a question remains about what is really being assessed. The main concern of this dissertation has been to explicitly analyze the use of reflection by the faculty at one particular medical school to help understand how those involved make meaning of all the different definitions. In this chapter, I provide a summary of the study, address limitations, discuss findings in light of

each research sub-question, draw conclusions, and then outline implications for practice and research.

Summary of the Study

Research Questions

This study aims to answer the following question: How is the concept of reflection used in the educational preparation of physicians? The following sub-questions help to answer the larger question:

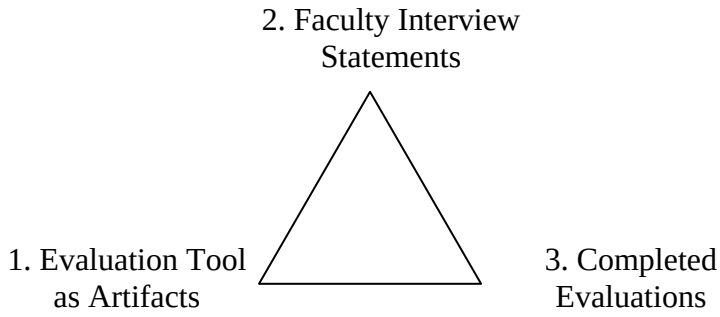
1. How is reflection defined and evaluated in the first 2 years of the medical school curriculum?
    a. What are faculty and administrators' beliefs and values related to reflection?
    b. What types of reflection are assessed: scientific, clinical, personal (Aukes et al., 2007)? Why were these items chosen?
2. What is the relationship between faculty's perceptions of a student's reflective ability (as demonstrated in scores received on tutor evaluations) and the level of mindfulness (Epstein, 1999) demonstrated in the student's assigned reflections?

Methods

This qualitative single case study examines the use of reflection within the medical school of a public Midwestern University. Along with reviewing existing evaluation instruments and guided student reflections, I interviewed faculty tutors and medical education deans to learn more about their perspectives. The goal

was to produce a thick description of the use of reflection at this medical school. In order to do this, I took a three pronged approach (see figure 4).

Figure 4: Three Pronged Approach to Data Analysis



First I analyzed existing evaluation tools as an artifact of faculty thinking about reflection. This included analysis of the individual behavioral descriptors that make up the tutor evaluation as well as an investigation of class performance on the evaluation. Second, I interviewed faculty about their perspectives related to reflection and their use of the tutor evaluation. Lastly I analyzed extant narratives created by students answering faculty generated "reflection questions". This last analysis included a comparison of student reflections to faculty ratings of reflective ability.

Findings

Although I noted overlap in definitions of reflection, each person interviewed had an overarching focus and unique way of looking at reflection. Different areas of emphasis included building professional identity, meaning making, soul searching, and using reflection to improve performance. Most interviewees said external evidence was needed in order to know if a student has

reflected. This evidence might be overhearing a conversation, noting improvement, or having a student tell you. A couple of those interviewed were particularly concerned with the subjective “mind reading” needed to assess reflection. All of those interviewed addressed the purpose of reflection with some emphasizing more immediate benefits like fitting in with the PBL group while others focus on longer term implications such as becoming a functioning physician. Most discussed the role of reflection in managing information. For some this was a major function of reflection while for others it was only a component. Several of those interviewed specifically discussed the role that reflection plays in developing professional identity. For them, reflection is not only about learning but about becoming.

The first and second year tutor evaluations were analyzed (a) to determine the types of reflection being assessed (Scientific, Clinical, Personal, General), and (b) to discern usage patterns across tutors. Analysis of the class as a whole showed that students rarely receive an Unsatisfactory in any performance area and for most performance areas a high percentage receive a Superior rating in any given block of study. The analysis of items for reflection type showed that Aukes et al.’s (2007) descriptions did not adequately cover all evaluation items. Some evaluation items appeared related to all three types of reflection. I interpreted this to indicate an overarching reflective skill. Also, a Mindfulness category emerged from the coding which focused on a student’s attention and presence in various situations. Items assessing reflection are found in all but two sections of the evaluation (Sources and Professionalism). Of the items assessing

reflection, 70% assess Scientific or Clinical Reflection which is consistent with the literature in terms of medicine's emphasis on these two types of reflection. Unlike Clinical and Scientific Reflection, which are seen throughout the evaluation, Personal Reflection was only seen in the sections assessing Group Interaction and Self Reflection. Descriptors for General Reflection were seen in the sections assessing Participation, Integration and Synthesis and Self Reflection. Mindfulness was seen in Group Interaction, Participation, and Professionalism sections.

Each student's reflective narratives from the first 2 years of study were analyzed using Epstein's (1999) Levels of Mindfulness. Individual question levels and an Overall level were assigned for each year. For both years, student reflections were most often coded as Level 2 Curiosity: Cognitive Understanding. One exception was a question that asked students to consider patient centered care qualities they would want a patient to identify in him or herself over the next year. For this question, the higher levels (4- Insight and Generalization, 5- Incorporation and Presence) were most often coded. For another question that asked students to describe how professionalism relates to the graduating medical student key characteristics, Mindfulness Level One (Imitation- Behavioral Modeling) was coded for more than two-thirds of all students.

From Year One to Year Two, eighty-seven percent (n=26) of students had changes in Level of Mindfulness for at least one question. Comparing reflections across years allowed me to identify shifts in thinking that could not be discerned when only using Levels of Mindfulness and only looking at a single year. In

looking across years, I noted (a) changes in self assessment of competency, (b) a shift to more practice oriented concerns, (c) shifts in emphasis related to motivation and lifelong learning, (d) changes in understanding related to the patient/physician relationship, (e) difference in the way students discussed ethics, and (f) the shifts in the way some students understood the intersection of outside roles with their role as a medical student. In comparing the years, both what was added and what was deleted provided information about shifts in understanding.

When I looked at individual performance, there was not a strong relationship between scores on the self reflection portion of their tutor evaluations and the mindfulness levels assigned to student responses to narratives. However, I did discover that these two assessments of reflection used together provide a more complete picture of the student and can both support and contradict each other. Looking at the student reflections in light of multiple tutors' evaluations of the student can reinforce the students statements as well as point out discrepancies between the student's and tutors' perceptions.

Limitations

I have identified five limitations of this study. These include my skill and knowledge limitations as a researcher, my position in relation to this case, constraints of using extant data, limited participation, and difficulty remembering events occurring in the past. Because the researcher is the primary instrument for data collection and analysis in case studies, these activities have been limited by my knowledge, past experiences, skills, and potential biases (Merriam, 2001).

While my employment position allowed greater access to participants and data than I might otherwise have been possible, I did have overlapping relationships with participants that could have influenced the research. Although I did not participate in the development of any of the evaluation tools that were studied, I do have responsibilities that put me in a position to influence their future use. I made it clear to participants that this study was related to my academic work and was prepared to address any concerns they might have regarding my role. Although no one expressed concerns, some participants may have been hesitant to discuss negative aspects of their experiences related to the use of reflection in the curriculum. Also, because most of the participants are busy educators and clinical faculty, there was limited opportunity for follow up interviews. Because extant data was used, it was not possible to ask students or tutors clarifying questions related to the reflection questions or tutor evaluations.

Lastly, because the tutor evaluation was developed several years ago, two of the main developers are no longer with the university and those remaining had a difficult time remembering the development process. One aspect of this research may be considered both an asset and a limitation. The evaluation data used in this study pre-dates this research. Therefore there was no opportunity to validate the items or do cross-rater reliabilities. This was important to the overall goal of this study which was to explore the use of reflection as it naturally developed, however this means that assessment items and student ratings reflect individual faculty perspectives rather than a standard definition of reflection.

Discussion

In this study, I investigate how faculty define reflection in the first 2 years of this medical school's curriculum and how students' written reflections relate to ratings of reflective ability given by faculty. The discussion of study findings is organized by the research questions that guided this study.

Definition and Evaluation of Reflection

This section addresses research Question 1: How is reflection defined and evaluated in the first 2 years of the medical school curriculum? To address this question, faculty tutors and administrators were interviewed and tutor evaluations were analyzed as artifacts of faculty thinking around the concept of reflection.

Faculty Beliefs and Values Related to Reflection

Although I noted overlap in definitions of reflection used by those interviewed, each person had an overarching focus and unique way of looking at reflection. Motivation to reflect, the role of reflection in connecting and organizing information so that it can be used, and individual differences in interest and ability to reflect, and the purpose of reflection were common topics of discussion. Various purposes mentioned by faculty included: building confidence, helping physicians know their boundaries and plan next steps, helping students organize their professional life in ways consistent with their values, helping students and physicians manage how he or she relates to the world and content of medicine, and managing emotions. This diversity of ideas is beneficial in that it combats the impulse to narrowly focus on one aspect of reflection in the curriculum, however,

it can also be confusing for students to understand feedback when “reflection” is not clearly defined or is defined differently depending on the assessor.

The role of reflection in building professional identity was emphasized by all three of the women interviewed. They focused on reflection developing “who am I” versus one of the men who discussed learning how to function in new roles— “how do I do things?” He may also have been talking about identity but it was not as clearly described as such. The women also acknowledged the importance of being aware of how the personal and professional might interact and influence medical decision-making. These differences may be a function of these particular individuals’ interests, but they could relate to having to struggle to balance personal and professional ways of being in a field that until fairly recently had been dominated by men.

I was a little surprised that the importance of taking another’s perspective did not come out as strongly in the interviews as it did in the literature. Aukes et al.’s (2007) definition of personal reflection includes learning from other’s experiences and Boenink, Oderwald, De Jonge, Van Tilburg, and Smal (2004) define reflection as “the conscious weighing and integration of views from different perspectives” (p. 368). Driessen, Van Tartwijk, Overeem, Vermunt, and Van Der Vleuten (2005) found that the mentors they interviewed focused on reflection requiring a student to take positions from outside their own perspective. Those I interviewed discussed acting on feedback from others, but did not put it in terms of taking that person’s perspective. They talked more about seeing yourself in someone else rather than trying to see things through the eyes of

another. Seeing yourself in another recognizes similarities, but taking on another's view acknowledges differences that may promote the surprise that initiates reflection.

A couple of the faculty touched on the difficulty of assessing reflection particularly with knowing how to assess an internal process. I faced difficulty myself when coding the tutor evaluations. I only coded items that I thought were intended to measure an aspect of reflection. My second coder initially coded many more items than I did. When I asked about her thought process, she said the person would have to reflect in order to do all of the items she coded. This is similar to the reasoning of the faculty who said the person must have reflected because they learned, which reminded me of Mezirow's (1981) assertion that the evaluative piece is essential to developing new perspectives. If the student has changed, he or she must have reflected. Both of these instances beg the question— How do you know if someone has reflected? Most interviewees said external evidence was needed in order to know if a student has reflected.

This does not mean reflection has to result in behavioral change, but in order for another person to assess the reflection there must be some way of knowing it has occurred. Either the reflector reports that it occurs or there is some observable change. The change that occurs could be in a changed attitude, emotion, or way of thinking that is not easily observed by another person. This could be because there has not been the opportunity to do so, the person has decided not to share the new perspective gained, or because the change in perspective results in the absence of behavior. For example, a student

might reflect on how they have been referring to patients and decide they want to stop referring to patients by their disease (he's a diabetic). There is a behavior change associated but because it is something the person is NOT doing, it may not be as noticed by others.

As you will recall from Chapter 2, Atkins and Murphy (1993) identified an overarching reflective process common to many theories of reflection. The process includes (a) a trigger of uncomfortable feelings or thoughts with a realization that current knowledge is not sufficient in the situation, (b) critical analysis which is an examination of feelings and/or knowledge, resulting in (c) new perspective/learning. Interviewees tended to emphasize one of these stages rather than addressing the full process of reflection. In general, most attention went toward triggers of reflection and on the new perspective gained. This emphasis makes sense in light of general discomfort of assessing the internal process of reflection. The tutor assessment does contain sections on critical thinking and problem solving which could also be considered internal processes. It would be interesting to know if the discomfort in assessing is more widespread and if the "personal" nature of reflection plays a role in the discomfort that faculty feel.

The surprise that initiates reflection may result from a deviation/discrepancy between a goal directed behavior (plan) and the outcome (Jones, 1995). This may be why students who struggle in medical school tend to become very reflective. They had a certain plan for their studies that did not work out. Now they have to figure out why. This also seems to relate to double and

single-loop learning (Argyris & Schön, 1974). A student who has consistently succeeded academically by memorizing may assume that memorizing = learning. When he or she faces difficulty, one option is to simply change an action strategy (i.e., stick with memorization but study longer or take more notes) in order to influence outcomes. This would be single-loop learning. The other option is to change the basic assumptions/values that drive their behavior (double-loop learning). The student may decide that memorization is not the only way to learn and in this situation is not the best way to approach learning medicine. This would lead the student to choose different study approaches.

Types of Reflection Assessed

Individual tutor evaluation items and faculty interviews were analyzed to determine the types of reflection being assessed (Scientific, Clinical, Personal, General). Because the tutor evaluation of first and second year students was locally developed by curriculum leaders, it was analyzed as an artifact of their thinking related to concept of reflection. General reflection was not part of Aukes et al.'s (2007) description of types of reflection but was added to account for items that apply to all three types. I was curious if the emphasis on Clinical and Scientific Reflection mentioned in the literature held for this school. I found that interviewees tended to discuss personal reflection more, whereas the written evaluation emphasized scientific and clinical reflection.

Although the tutor evaluation contains a specific section titled Self Reflection, I made the decision to analyze all sections because reflection is so often called by different names (i.e., deliberation, problem solving, critical

thinking). Usage patterns across tutors showed that in most blocks and across most performance areas at least half of the students earn a Superior. The evaluations are criterion based so it is possible for all students who meet the criteria to achieve this rating. But some tutors may also be hesitant to give average or below average ratings fearing that negative decisions could be made based on this feedback. Many tutors do not use the behavioral descriptors to provide students specific feedback and some tutors only provide an Overall rating and choose not to use the individual sections at all, which complicated the analysis and leaves some students without written feedback on their performance in these areas

At this school, the written evaluation clearly defines self reflection in terms of taking external feedback and using it for improvement. In general even developers were unsatisfied with the version of reflection measured in the Self Reflection section. Finding this definition lacking, some spend little time providing feedback in this area while others do use this section regularly. Because students have one or two different tutors every block, they receive feedback in this area at least 14 different times in their first two years of study. Even if some tutors choose not to use this section, the student still receives ample feedback. Some of the differences in tutor interpretation are smoothed by having so many different individuals provide feedback. Students are able to see their feedback over time and can interpret if one tutor's assessment of their ability seemed out of line with others. In addition, written comments and mid-course face-to-face meetings also help students to understand how a specific tutor may be

interpreting parts of the evaluation. Students can ask for clarification, however, some may not feel comfortable doing so.

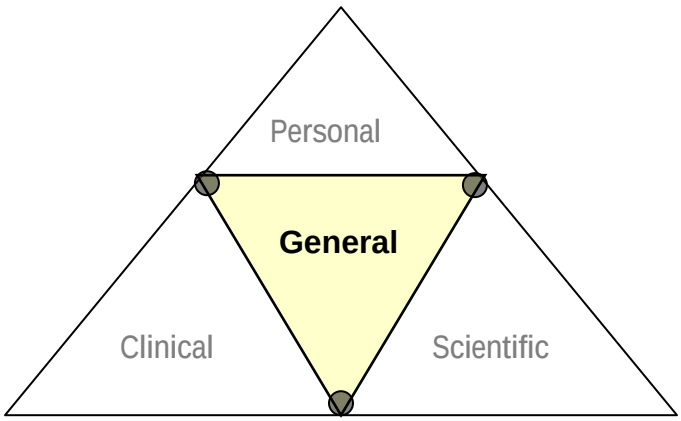
Items assessing reflection were found in all but two sections of the evaluation. Consistent with the literature, a large portion of the items assess Scientific or Clinical Reflection (Tanner, 2006). Interestingly, the Self Reflection Section had more emphasis on Personal and General Reflection than on Scientific or Clinical Reflection. Unlike the overall written evaluation which focused on Scientific and Clinical Reflection, interviewees tended to emphasize learning from experience (personal reflection); although all types were discussed. Since the evaluation section was consciously labeled “reflection”, I was a little surprised Scientific and Clinical were not more heavily represented in this performance area and the interviews. This difference may in part be due to this school having a PBL curriculum. Faculty at non-PBL schools may be more likely to use critical thinking and problem solving interchangeably with reflection, but since the faculty at this school regularly discusses problem solving and critical thinking they may have these terms more clearly differentiated that those in other medical settings.

Also, one might expect Scientific Reflection to predominate since the first 2 years of medical school emphasize the basic sciences, however clinical reasoning was also well represented. This may be due to this school having a PBL curriculum that provides students the opportunity to begin developing clinical reasoning through the use of cases. It would be interesting to see how non-PBL schools deal with the development of clinical reasoning in the first 2 years.

Unlike Clinical and Scientific Reflection that are seen throughout the evaluation, Personal Reflection was only seen in two sections (Group Interaction and the Self Reflection). Using experience to make meaning is emphasized in the “softer” performance areas but is not discussed in areas such as problem solving or critical thinking. Descriptors for General Reflection were seen in the sections assessing Participation, Integration and Synthesis and Self Reflection. Mindfulness was assessed in the Group Interaction, Participation, and Professionalism sections.

While analyzing the tutor evaluation and relating the interviewees beliefs to the different types of reflection, I realized that these types are not completely distinct. They relate to each other and overlap to some degree. For example, Personal Reflection is about making meaning from experiences. These experiences could be clinically or scientifically oriented and influence the person’s subsequent Clinical and Scientific reflection. Rather than subsuming all three types of reflection, General reflection seems to meet at the intersections of the three. It is needed for all types and provides a bridge between the types but does not transcend them. Figure 5 illustrates the way I have conceptualized the relationship amongst the different types of reflection in medicine.

Figure 5: Relationship between General and Other Types of Reflection



Faculty Ratings and Mindfulness Levels

This section addresses research Question 2: What is the relationship between faculty's perceptions of a student's reflective ability and the level of mindfulness demonstrated in the student's assigned reflections? To address this question, students' existing answers to reflection questions asked in their first and second years of study were coded using Epstein's (1999) Levels of Mindfulness then compared to the tutors' evaluations of the students' reflective ability. This included consideration of individuals' Self Reflection and Overall portions of the tutor evaluations (including comments) and the student's response to reflection questions as a whole.

In analyzing the reflections, I was not attempting to assess the individual's level of mindfulness but rather determine whether I could discern these levels in students' writings. And after that whether these levels had any relationship to the

faculty's assessment of a student's ability to self reflect. Because there are so many definitions of reflection, discrepancies could mean that the tutor evaluation touches on different aspects of reflection than those described by Epstein's (1999) levels. This is indeed what I found.

Reflection Questions

Asking students to answer questions provides structure and support for reflection thereby encouraging what some students might not naturally do. The reflection questions are intended to induce the sense of wonderment that Schön says triggers reflection and to make reflective practice explicit. In professional preparation, reflection can provide connections between theoretical learning and personal experience. I chose Epstein's (1999) Levels of Mindfulness to assess the students' reflection responses because his broad view of reflection is not limited to clinical or scientific aspects of medicine and because he explicitly discusses the relationship between reflection and the patient-physician relationship. For Epstein (1999), individuals can actually approach life and practice with a state of wonderment. Rather than waiting for a trigger, individuals can strive to be really present in all situations. This is mindfulness. Copying vast portions of one's reflections from the previous year or simply listing items rather than exploring the personal meaning for future practice is not consistent with someone who is truly present in approaching this activity with a sense of wonder,

Subtleties in language were important when determining levels. As the coding scheme developed, I noted that reflection narratives coded at lower levels used more passive language about their strengths, weaknesses and plans for

improvement. Student reflections coded at higher levels used more active language about past experiences and about opportunities they planned to pursue rather than simply letting things happen to them. Differences in language indicate how the student frames the relationship between their knowledge and practice. Some seemed to approach their reflections as identifying right or wrong versus identifying the “why” in a situation. Some explored why they thought a certain way and related it to experience. Others just listed strengths or weaknesses with little exploration.

At Level 1, individuals are simply imitating information, but at Level 2 (Curiosity: Cognitive Understanding) individuals make decisions based on cognitive models and reflect to generate hypotheses but ignore personal knowledge, tacit knowledge, and emotions. This level of mindfulness corresponds to what King and Kitchener (1991) describe as “traditional definitions” of critical thinking in which the thinker assumes knowledge is authority based and that questions can be well defined. Problem solving becomes a quest to find the best authority to answer the question. If there is one correct answer, there is no reason to consider multiple alternatives. Uncertainty is a temporary state until the “right answer” can be discovered. Some of the narratives at these lower levels talked about building strengths by participating in the curriculum. These students trusted that by showing up and doing what was required, they would learn what was needed for practice. Those at higher levels demonstrated less reliance on an authority to provide THE right answer. Levels

three to five may be more indicative of what King and Kitchener call reflective judgment.

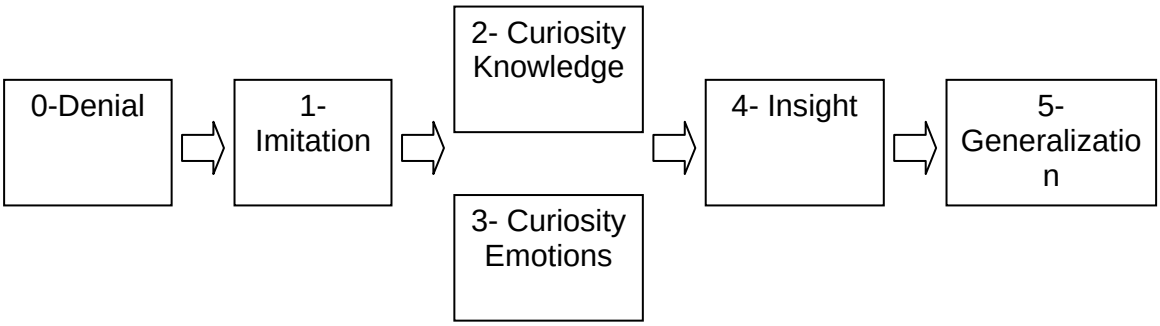
Very few students address attitudes, beliefs, or emotions in their reflections especially about how these things might interact within the patient/physician relationship. Understanding this interaction is integral to the ability to provide patient centered care, so I would have hoped to see more exploration in this area. In part this may due to the risky nature of sharing personal information even though these reflections are always de-identified before being viewed by faculty and staff. Although students know their answers are shared with faculty and administrators in aggregate with no identifiers, they may fear that sharing weaknesses or struggles may hurt their career should the information “get out”. The school is in the process of developing a system for students to invite trusted mentors to review their answers in order to provide feedback.

Sometimes students discussed cultural competency but it tended to echo language used to discuss these topics in class rather than demonstrate a deeper understanding. In discussing reflection in the professions much attention is given to reflection initiated by practice, but at least a couple of students bring up the influence of outside roles—husband, wife, church member, community activist. This is consistent with Scott, Brown, Lundt and Thorne’s (2004) assertion that external forces may also initiate reflection.

Coding challenges. Coding the reflections brought to light limitations of the levels themselves as well as difficulties with the process. Epstein’s (1999)

Mindfulness levels seem to imply a continuum but in using them to code question responses, they seem to function more like separate anchors. Level Three in particular did not always seem to fit between 2 and 4. Sometimes when coding, a response might not quite be a Level 4, but it was not possible to code it as a Level 3 because the response was not focused on emotion. In those cases the response was coded as Level 2. This meant a fairly wide range of responses were coded as Level 2. This was particularly the case for the Overall rating which attempted to look across all questions to provide a composite level. For example, if responses showed some evidence of Level 4- Insight but were mostly at Level 2- Curiosity: Cognitive Understanding, it does not fit to assign a Level 3- Curiosity: Emotions and Attitudes. Perhaps rather than a continuum, levels 2 and 3 are parallel levels with different focuses that could both lead to insight (level 4). See Figure 6 for a diagram of the proposed relationship between the levels of mindfulness.

Figure 6: Proposed Relationship between Levels of Mindfulness



For a couple of the questions, students were specifically asked to consider and respond to an outside criteria which somewhat conflicts with the definitions of the higher levels. Also, very few reflection responses were coded at Level 3-

Curiosity: Emotions and Attitudes which may indicate that students are developmentally not at this Level of Mindfulness, but it also might be difficult to tap into this kind of emotional curiosity using this type of writing.

Coding reflection responses for Level of Mindfulness was difficult. Some answers were relatively short. If students did not provide examples or relate their thoughts or intensions back to an experience, it was difficult to determine if the answer was simply repeating what the student considered a formula for successful doctoring (Level 2- Cognitive Curiosity) or if the entry was more indicative of internalized values or perspectives (Level 4-Insight). In looking at the reflections coded both by me and my secondary coder, agreement was more frequent for questions coded level 2 or lower than those coded at higher levels. Responses for some questions seemed easier to code than others. It seems somewhat clearer and easier to identify what is missing than to agree upon what is there.

Rater bias. Rater bias is always a concern when using this type of scale. A couple of times I noticed having my own emotional reaction to the content of a student's statement rather than simply looking for the elements of various levels. I noticed both positive and negative reactions. Sometimes my reaction was to a student's verbal clumsiness around an issue that I value such as the right of patients to make informed decisions about their health. I did notice that this could be used as a clue about the student's level. At Level One: Imitation, students cite rules without evidence of curiosity about the knowledge and use language that may indicate incomplete understanding. But then a decision had to be made

about whether this was a difference in values between rater and student or if it truly was an incomplete understanding. This was difficult.

In coding student reflection narratives across two years, I may have been influenced to give lower levels if I recognized large portions of repeated text because that seemed to take less effort than developing new responses. Since mindfulness is about being present in any given situation, it seemed as if the student was not expressing wonderment if he or she simply changed the tense of the answer from one year to the next. There may be some legitimacy to lowering levels if the student makes no effort in the second year, but this was not done in a systematic way for this study because each year was looked at independently before being considered as a whole. At the same time, more questions were coded at Level 5 in Year 2 than in Year 1. Without more analysis it is unclear whether my expectations subtly shifted after analyzing so many responses or if the higher levels were due mainly to students' performance.

Reflection comparison. Because the Levels are fairly broad, smaller changes in thinking were obscured by only using the Mindfulness Levels to assess the reflection narratives. Comparing reflection narratives across years shows growth that looking at a single year cannot- even when the level stays the same. Merging reflections revealed subtle changes in student thinking that were not obvious when looking at the documents side by side. Things that might not have seemed reflective in Year 2 take on new meaning when read in context with Year 1. Progression in thought was illustrated by additions, deletions, and changes.

I think you can make some inferences based on lack of change as well. Either the person actually experiences no change at all (which seems unlikely) or they did not make the effort to truly reflect on the previous year. Some showed consistent effort while others made less effort in Year Two. Again, there are likely individual factors such as interest, time available, ability related to how much detail a student provides but there may also be issues related to how the purpose of the activity is communicated to the students, its placement in the curriculum, and how safe students believe it is to share personal information.

Relationship between Reflection Questions and Tutor Evaluation of Self Reflection

No real pattern emerged when looking at the mindfulness levels of those students with the highest tutor averages. Students with tutor evaluation averages in the top half of all participants were assigned a range of Mindfulness Levels from 1 to 4. However, when looking at tutor evaluation scores of those with higher Mindfulness Levels, most of those with Mindfulness Levels of 3 or higher were also in the top 50% for tutor evaluations. Students demonstrating higher levels of mindfulness also tend to use feedback to improve, but those good at using feedback are not necessarily more mindful. It could be that using feedback is a more foundational skill to the higher levels of mindfulness or that certain individuals were strong in both areas while others were only strong in one.

Although the numbers analyzed were relatively small, in looking at the relationship of tutor scores to Mindfulness Levels, there were some gender differences. I noted that a higher percentage of women (85%) consistently

received superior ratings from their tutors in the area of self-reflection than did the men (53%). Seven of the eleven students receiving Overall Mindfulness Levels at Level Three or above were women. In addition, only women received Overall Mindfulness Ratings of Level 3 (Curiosity- Emotions and Attitudes). Students receiving Honors from most of their second year tutors received an Overall Mindfulness Level 2 (Curiosity- Cognitive Understanding) in one or both years. Most of the women who consistently received honors actually had lower Mindfulness Levels in Year 2 compared to the men whose Mindfulness Levels either increased or stayed the same. There may be differences related to gender in the way tutors interpret women's and men's abilities or differences in the messages that students receive about what it important and expected that could be further explored.

Similar to the numerical analysis, looking at the students' entire body of work did not reveal strong patterns. I did notice however that by looking at both the tutor evaluation and the reflections together, a more complete picture of the students' experience emerged. These two evaluations sometimes supported and sometimes contradicted each other. Looking at the student reflections in light of multiple tutors' evaluations of the student can reinforce the students statements as well as point out discrepancies between the student's and tutors' perceptions. Assessing reflection is richer when it includes student generated work and the perspectives of those who interact with the individual on a regular basis.

Conclusions

From this research, I have drawn the following conclusions:

1. Some educators are uncomfortable with assessing reflection because it is an internal process. Learning is also an internal process which is regularly assessed, but reflection is viewed as different. In part this may be due to all of the different definitions and lack of an agreed upon standard about what constitutes reflection. How do you know when someone has reflected? Some assume that reflection is essential to learning, so if a student has learned they must have reflected. For many, assessing reflection is really about assessing the students' new perspective gained by reflecting.
2. Faculty members tended to focus on one aspect of the phases of reflection rather than looking at the entire process. In general most attention went toward triggers of reflection and on the new perspective gained. Again, this may be due to the internal nature of reflection. Many tutors have likely not been exposed to theories related to reflection and so may not have the language to really talk about it.
3. Although scientific and clinical reflection are more heavily assessed in the tutor evaluation, faculty tended to discuss personal reflection (learning from experience) as often if not more than the other two. Perhaps because this school has a PBL curriculum and problem solving and critical thinking skills are regularly discussed, the faculty may consider these distinct from

reflection. Therefore, they may consider Personal Reflection to be reflection.

4. It is possible to see Level of Mindfulness in students' written narratives. Mindfulness is a quality that can be brought to any reflection. Mindfulness level is a qualitative descriptor that could apply to any type of reflection. Rather than a type, Mindfulness Levels are useful in describing the focus of student reflections (i.e., imitation, cognitive understanding, emotions, insight, generalization) and this can be identified in students' writing.
5. Levels of Mindfulness are too broad to catch more subtle shifts in thinking. Because the Levels are fairly broad, smaller changes in thinking were obscured by only using the Mindfulness Levels to assess the reflection narratives. Things that might not have seemed reflective in Year Two take on new meaning when read in context with Year One. Perhaps rather than a continuum, levels 2 and 3 are parallel levels with different focuses that could both lead to insight (level 4).
6. Mindfulness Level 2 (Curiosity: Cognitive Understanding) matches the focus of Year One and Two students' education which is to build their knowledge base. A large proportion of the student reflection narratives were coded at Level 2. This in part may be due to the students' location at the beginning of their profession education which is focused on building the foundational knowledge needed to move forward.
7. Qualities of prompting questions seem to influence the level of reflection inspired. Questions that ask students to identify strengths and

weaknesses in relation to an outside standard (such as the graduating medical student competencies) may encourage some students to simply list characteristics. Questions that encourage students to tell stories and give examples provide more evidence to determine Mindfulness Level and may better stimulate reflection.

8. Students demonstrating higher levels of mindfulness also tend to use feedback to improve, but those good at using feedback do not necessarily demonstrate higher levels of mindful. The definition of self reflection underlying the tutor evaluation focuses on using external feedback to make improvements. Students who were rated as being good at using feedback did not necessarily have their reflection narratives rated at higher levels of mindfulness. However, most of the students at higher levels of mindfulness were also judged to be good at using feedback to improve. It could be that using feedback is a more foundational skill to the higher levels of mindfulness or that certain individuals were strong in both areas while others were only strong in one.
9. There may be some gender differences related to which aspects of reflection one attends. There were many overlaps in attention and focus across all those interviewed, however it was notable that only women emphasized the role of reflection in building professional identity. Also, only women’s reflection narratives were given Overall Levels of Level 3 (Curiosity: Emotions and Values). The data for this study were not

sufficient to determine any gender differences but it was an interesting tendency that may bear further investigation.

Implications for Research and Practice

Conclusions drawn from this study have implication for the practice of medical education and future research. Practice implications include (a) the use of reflection types to open dialogue between faculty about reflection, (b) points to consider when using Levels of Mindfulness to assess written narratives, and (c) the value of mentoring in promoting reflection. Research implications for further research include (a) concentration on the critical analysis phase of reflection, (b) explore the relationship between previous healthcare experience and mindfulness, (c) analyze similarities and differences of narratives within each Mindfulness Level, (d) gather students' perspective on the assessment of reflection, (e) explore the possible gender differences in reflection, and (f) explore whether experienced physicians also use less personal reflection.

Practice

Faculty expressed some discomfort with assessing reflection. Starting the dialogue about reflection with a review of the literature on the topic could help faculty come to a common understanding about reflection. For example, using Aukes et al.'s (2007) definitions of types of reflection in medicine (Clinical, Scientific, and Personal) could provide a common language for faculty to be more precise about what they are trying to promote and assess. In addition, using the Atkins and Murphy's (1993) overarching phases of reflection could also

help faculty understand the general process of reflection and consider ways they may promote it. It is important to start with a good literature based understanding but also to collaboratively build a local definition of reflection to guide curriculum and assessment.

While using the Mindfulness Levels to assess reflection narratives has limitations as discussed above, this type of coding scheme can provide valuable information to students and educators. When evaluating responses to the same questions across multiple years for the same student, assigning Levels of Mindfulness to the change in reflections from one year to the next would compensate for some of the broadness in the Levels. It is also important to consider how the quality of the question interacts with the possibility for levels. One suggestion would be to pilot questions and model new questions after those that seem to elicit more thoughtful answers. Consider asking students to relate stories rather than simply asking them to “describe” their thoughts. Also, ask students questions that prompt students to think about both similarities and differences between their own perspectives (beliefs, values, attitudes) and those of patients and other members of the healthcare team. However, if the Mindfulness Levels are to be used there are a number of coding issues/decisions that should be addressed which include:

1. The influence of prior questions on coding subsequent questions. Coders may be influenced to make assumptions about what a person means based on prior questions.

2. Whether reflections should be assessed in relation to other students. Quality and effort is more obvious when comparing across students, but then the Levels are not being used as an independent criterion.
3. Development of a systematic way to account for effort in relation to the levels assigned across years.
4. If and how the student's educational level changes expectations as to reflection level. I would expect students' perspectives to be more sophisticated and nuanced, but the Mindfulness Levels in their current form cannot really account for this.
5. If (and how) changes in the student's writing skills should or should not influence Mindfulness Level.

Although many of the students' narratives showed very strong reflective abilities some did not. A portion of the assessment will always depend on the students in terms of how seriously they take the activity, their disposition, and the time they take to complete the exercise. But even when taking it seriously, some students might not be capable of the level of personal reflection required by some programs and may need coaching (Boud & Walker, 1998). Baernstein and Fryer-Edwards (2003) found that faculty interviews of students prompted more in-depth reflection than writing alone. Students receive extensive information about their performance through interactions with others, their grades, and in formal evaluations, but some may need help sorting through the information and what it

means for their practice. This school is in the process of developing a mentoring program that would help students make sense of the information.

Research

In medicine the literature regarding reflection tends to focus on attempts to implement reflective practice and educational approaches with less attention to empirical studies. In this study rather than looking at **one** effort or analyzing **one** approach, I wanted to look at reflection holistically. Rather than implementing an intervention, I wanted to see how these things had grown up organically amidst all of these definitions of reflection. The current study contributes by describing how people responsible for the education of medical students make meaning of all this information. It also describes which definitions and purposes are sufficiently valued by faculty to merit assessment. By addressing the meaning and assessment of reflection, this study will benefit medical educators by helping illuminate their thinking around these topics. Better understanding of the teaching of reflection will help future students to be more reflective practitioners, which ultimately benefits patients.

Many questions arose from outside the scope of the current study that point the way to future research. Implications for further research are outlined below:

1. Focus on the critical analysis phase of reflection. Because so few actually discussed the critical analysis phase of reflection, I would like to explore this issue further with interviewees – specifically asking them to describe what is happening when someone reflects.

2. Explore the relationship between experience and Level of Mindfulness – specifically previous healthcare experience. Although I did not specifically analyze the reflections in relation to experience, it seemed that students with previous healthcare experience really drew upon this in answering the reflection questions. It may be that some students simply do not have the experiences to draw from at this point in their academic career.
3. Analyze similarities and differences of narratives within each Mindfulness Level. The current study focused upon the individual students' portfolio of information. The next step would entail gathering all responses within a level and analyzing similarities and differences with the goal of refining the Mindfulness Level rubric.
4. Explore the relationship between levels of Mindfulness. Are they a continuum or not? Calling them levels seems to imply a continuum but in using the descriptors to code question responses, they seem to function more like separate anchors. Level Three in particular did not always seem to fit between 2 and 4 because of the focus on emotion and values.
5. Gather students' perspective on the assessment of reflection including: (a) approach to answering reflection questions; (b) perceptions of the purpose of the questions and reflection; (c) perceptions of safety to express themselves freely; and (d) how they think they will use reflection in practice.
6. Explore the possible gender differences in reflection. Although not specifically focused on gender issues, some possible links to gender and

attention to reflection did emerge. Future studies could more explicitly analyze this possible relationship.

7. Further explore the use of General Reflection in medicine. In coding the tutor evaluation, the types of reflection outlined by Aukes et al. (2007) did not adequately cover all items. Some evaluation items applied to all three types of reflection which indicated some overarching reflective skill. Therefore I developed the General code. Further study is merited.
8. Explore whether the finding that experienced physicians use more non-analytical methods in practice (Norman & Brooks, 1997; Schmidt & Boschuizen, 1993) applies to all types of reflection. Do experience physicians also use less personal reflection?

Closing

As this research has shown, assessing reflection in medical education is itself a complex problem. Using some of the available conceptions of reflection such as Aukes et al.'s (2007) definitions of types of reflection in medicine (Clinical, Scientific, and Personal) and Atkins and Murphy's (1993) overarching phases of reflection could provide a common language for faculties to be more precise about what they are trying to promote and assess. They could also be used as a starting point for the development of local definitions of reflection which can be widely shared among faculty and students. These local conversations can also inform the national conversation about reflection in medical practice and it's use and assessment in the preparation of future physicians. It is especially

important to continue the dialogue about the relationship between reflection, professionalism and patient-centered care.

Appendix A: Graduating Medical Students Key Competencies

Our goal is to create educational experiences that help our graduates (both medical students and residents) attain excellence in the eight characteristics below, with a special emphasis on their ability to deliver effective patient centered care.

Able to deliver effective patient centered care

Our graduates are able to deliver care that improves the health of individuals and communities. Patient centered care reflects a respect for individual patient values, preferences, and expressed needs. This care is grounded in the best available evidence and conserves limited resources. It depends on shared decision-making and active patient participation. Our graduates' care will be marked by compassion, empathy and patient advocacy.

Honest with high ethical standards

Our graduates' behavior reflects honesty in relationships with patients, colleagues and societal systems designed to support health care. In practice our graduates understand and adhere to the basic principles of medical ethics including justice, beneficence, non-maleficence, and respect for patient autonomy.

Knowledgeable in biomedical sciences, evidence-based practice, and societal and cultural issues

Graduates possess a fund of knowledge that reflects the current understandings in basic biomedical sciences, clinical disciplines, and social issues that impact patient care. Their knowledge is judged as excellent by faculty and exceeds the expectations of the public and of next-level mentors.

Critical thinker, problem-solver

Problem solving and critical thinking engage three interdependent components: knowledge base, processing skills, and insight (metacognition). From a strong knowledge base, our graduates process and modify information through intellectual curiosity and by questioning the status quo.

Able to communicate with patients and others

Our graduates demonstrate competence in verbal and nonverbal communication skills with patients, families and health care providers in order to establish professional, caring relationships and to facilitate the delivery of high quality, compassionate patient- centered health care.

Able to collaborate with patients and other members of health care team

Collaboration is a process through which patients and members of inter-professional teams see different aspects of a problem, explore constructively their differences and search for and implement integrative care solutions that transcend their own limited vision of what is possible. The collaboration process is achieved through mutual cooperation, respect, exchange of information and meaning, sharing resources, and enhancing each other's capacity for mutual benefits.

Committed to improving quality and safety

Our graduates work as members of the health care team striving for excellence in the quality of patient care and safety. These graduates assess the results of current practice, analyze the literature to determine best practice, and take action to close any gaps. They recognize their own limitations and acknowledge the potential hazards in delivering health care. They problem solve and reconcile errors and near misses. They are committed to proactive systems improvement.

Committed to life-long learning and information mastery

Our graduates are committed to self-assessment and improvement. They continually appraise and assimilate scientific evidence to keep abreast of changes in medical knowledge and practice. Graduates know the basics of how information is organized as well as how to access it effectively. They are competent in synthesizing this information and communicating the knowledge gained from this process.

Appendix B: Comparison of Theories of Reflection

			Atkins & Murphy's Proposed Overarching Stages			
Theory	**Definition**	**Purpose**	**Awareness of Uncomfortable feelings**	**Critical Analysis**	**New Perspective (Outcome)**	**Comments**
Dewey (1933)	"active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (p.9). (Problem solving, critical inquiry)	"to enable us to know what we are about when we act" (p. 17).	Identification & formulation of the problem Pre-reflective stage	Reasoning from evidence, developing a hypothesis, testing the hypothesis	Reformulation of an outcome	Reflection requires awareness of a true problem with an uncertain solution
Knowles (1975)	Limited reflective thinking to interpretation of data, application of facts and principles, and logical reasoning	Enables self-directed learning	Change in life events		Immediate application, problem solving	Theory of Adult Learning
Schon (1983, 1987)	Turning thought back on action and on the knowing which is implicit in knowing (p. 50)—Thinking what you are doing	To deal with something puzzling, troubling, or interesting	Surprise	On outcomes, action, and intuitive knowing Make use of accumulated experience	Enriched repertoire	We know more than we can say—knowing can be seen in our actions.

			Atkins & Murphy's Proposed Overarching Stages			
Theory	**Definition**	**Purpose**	**Awareness of Uncomfortable feelings**	**Critical Analysis**	**New Perspective (Outcome)**	**Comments**
Boud, Keogh, and Walker (1985)	Extend Dewey's definition to include grounds of feelings as well as beliefs-recapturing, thinking about, mulling over and evaluating experience; Goal directed	General goal to reconstruct experience. May not be clear to the learner at the time	Prompt does not have to be negative, as person becomes better at reflecting the prompt is more often their own affect	Returning to experience → Attending to feelings → Evaluating experience	Affective & Cognitive changes that may or may not lead to behavioral changes	Contribute an emotional component to refection

			Atkins & Murphy's Proposed Overarching Stages			
Theory	**Definition**	**Purpose**	**Awareness of Uncomfortable feelings**	**Critical Analysis**	**New Perspective (Outcome)**	**Comments**
Mezirow (1991)	Not all awareness of thought & feeling is reflective and suggests confining definition to Dewey's—Reflection means validity testing. Can be part of planning action or used retrospectively to assess a process or premise. <u>3 Types of Reflection</u> Content: description of the problem Process: strategies and procedures of problem solving Premise: critique of presuppositions	To find similarities and differences between current experience and prior learning, make generalizations, identify patterns, create metaphors for extending meaning, decide on next steps	Problems can be instrumental or in the communicative domain. We use reflection when we need guidance or run into difficulty. Interpretation/ Problem Posing	Includes many possible paths and sub-processes including scanning, propositional construal, thoughtful action, imaginative insight.	Reflective Action: Reflective Learning involves elaborating, confirming or creating a scheme Transformative Learning involves changes in meaning perspectives	Criticizes adult learning theories general disregard for the role of reflection; Added to Dewey. Dewey did not examine how expectation might affect reflective thought. Meaning perspectives = 's frames

			Atkins & Murphy's Proposed Overarching Stages			
Theory	**Definition**	**Purpose**	**Awareness of Uncomfortable feelings**	**Critical Analysis**	**New Perspective (Outcome)**	**Comments**
King & Kitchener (1991)	Reflective judgment is developmentally displayed in progressively more complex and abstract stages from Pre-reflective to Quasi-reflective to Reflective thinking.	To find solutions to ill-structured problems	Initial recognition that the ill-structured problem requires a solution	Recognize multiple perspectives & compare and relate evidence to make judgment. Stage 7- Judgments carry different weight and critique applies to self as well as others.	Solution must be constructed (rather than "found") Stage 7- Beliefs are justified probabilistically	Stage 6-7, considered Reflective thinking, does follow Atkins and Murphy's overarching stages
Epstein (1999)	Expand reflection to the notion of mindfulness—attending in a non-judgmental way to one's one physical and mental processes in everyday tasks to act with clarity and insight	To become aware of one's own mental processes and biases and become more flexible in order to act more compassionate-ly	Awareness is purposefully cultivated	Levels 0-5	Varies depending on level	Experience is part of evidence that should be considered in evidence based medicine.

			Atkins & Murphy's Proposed Overarching Stages			
Theory	**Definition**	**Purpose**	**Awareness of Uncomfortable feelings**	**Critical Analysis**	**New Perspective (Outcome)**	**Comments**
Aukes et al. (2007)	Personal reflection is "the exploration and appraisal of one's own and other's experiences, thus clarifying and creating meaning, for the benefit of balanced functioning, learning and development" (p. 178).	Sense-making in medical practice, adapt to situations professionally		Self-reflection: introspective, prerequisite for framing or reframing thoughts, feelings, norms or methods Empathetic Reflection: Social, inter-subjective, contextual understanding and appraisal Reflective Communication: Behavioral expression of the two previous.		3 types of reflection medicine: clinical, scientific, and personal. Types do not easily fit into Atkins and Murphy's stages.

Appendix C: Self Reflection Items from the Year 1 and

Year 2 Tutor Evaluations

Each section contains an “Overall” rating of student performance and lists of descriptors organized by performance level: Unsatisfactory, Satisfactory, Superior. The Self Reflection items are listed below by level of performance.

- ☐ **Unsatisfactory**
  - ☐ Unaware or unconcerned about role in group
  - ☐ Insensitive to feedback
  - ☐ Performance is marginal without improvement
  - ☐ Resists suggestions from peers or tutors
  - ☐ Evaluates self in superficial manner at mid-block
  - ☐ Inconsistent or incomplete response to mid-block evaluation feedback
  - ☐ Makes no attempt to apply course content to framework of future practice
  - ☐ Gives feedback that is personalized and humiliating to the recipient
  - ☐ Receives feedback with anger, and/or personal attack on the giver
  - ☐ Does not use feedback to improve performance
- ☐ **Satisfactory**
  - ☐ Monitors group reaction/interaction to self
  - ☐ Able to use mid-block information to improve performance
  - ☐ General evidence of self assessment and improvement
  - ☐ Feedback is sometimes utilized to improve performance
  - ☐ Usually careful to provide constructive feedback
  - ☐ Receives verbal and nonverbal feedback and changes behavior accordingly
  - ☐ Demonstrates the ability to apply knowledge of patient reaction to self and provide effective patient care
- ☐ **Superior**
  - ☐ Consistently self monitors interaction with group and incorporates information to promote better self and group learning
  - ☐ Self critical and monitors own learning
  - ☐ Continually appraises and assimilates evidence to refresh knowledge base
  - ☐ Consistent evidence of self assessment and improvement
  - ☐ Careful to provide useful feedback in considerate manner
  - ☐ Always considers validity of feedback received for improving self performance
  - ☐ Evidence of self assessment and improvement
  - ☐ Demonstrates the ability to apply knowledge of patient reaction to self and provide effective patient care

Appendix D: Guiding Questions for Faculty and Administrator Interviews

These are simply guiding questions. Participants' responses will prompt follow-up questions.

1. What is your educational background? How long have you worked for the medical school?
2. How long have you tutored for PBL or the patient care course?
3. Were you involved in the creation of the Year 1 and Year 2 tutor evaluation? If so, can you tell me about the process?
4. Do you remember any of the discussions around the self-reflection section of the evaluation?
5. How much time does it take to complete an evaluation per student?
6. Do you keep notes or look at any other type of documentation while completing the evaluation?
7. How is reflection related to performance in the first 2 years of medical school?
8. How is reflection related to the third year and beyond?
9. What is your impression of students' reflective abilities upon entering medical school?
10. Does reflective ability seem to change over time? In what ways?
11. Please comment on each evaluation item.

Appendix E: Order of Data Analysis

Analysis Activity	Order of Analysis
Reflection Questions	
1. Analysis of content of student response by year	1
2. Coding of responses for Level of Mindfulness by year	2
3. Comparison of changes in Level of Mindfulness across years	3
4. Merging and analysis of Year 1 and Year 2 responses	8
Tutor evaluation	
1. Coded items for type of reflection	4
2. Analyzed the overall class performance for two years	5
3. Analyzed individual performance on the Self Reflection section a. Assigned and recorded score for each block (see table) b. Averaged each by year and by course (patient care, PBL)	6
Faculty Interviews	
1. Direct interpretation of the use and development of the tutor evaluation and reflection questions	7
2. Content analysis of perceptions of reflection	7
Relationship between Tutor Evaluations and Faculty Interviews	
1. Correlation	7
2. Qualitative analysis including tutor comments	8

Appendix F: Waiver of Documentation of Consent

The Use of Reflection in Medical Education

Principal Investigator: Melissa Griggs
PhD Student in Educational Leadership and Policy Analysis

Advisor: Joe Donaldson, Ph.D.
Professor in Educational Leadership and Policy Analysis

INFORMATION STATEMENT

1. Invitation to Participate and Description of the Project.
You are being asked to participate in my study of how reflection is used in the education of medical students. You are being asked to participate because you are involved in the first and second year curriculum. Your participation in the research study is voluntary. Before agreeing to be part of this study, please read and/or listen to the following information carefully. Feel free to ask questions if you do not understand something.

2. Description of Procedure.
If you participate in this study, you will be asked your opinions about reflection and its relationship to medical practice. You will also be asked questions about the tutor evaluation used in the first and second year curriculum. This information will be recorded so that I might analyze it at a later date.

3. Risks and Inconveniences.
There is a possibility that some of the questions in the interviews may make you feel uncomfortable. This rarely happens, but if you do feel uncomfortable, you can do any of the following: you can choose not to answer certain questions, you can take a break and continue later, or you can choose to stop the interview or focus group.

4. Benefits.
This study was not designed to benefit you directly, however, there is some possibility that you may learn about reflection in medical education through your participation. In addition, what we learn from the study may help us to better understand the use of reflection in medical education.

5. Confidentiality.
Any and all information obtained from you during the study will be confidential. Your privacy will be protected at all times. You will not be identified individually in any way as a result of your participation in this research. The data collected however, may be used as part of publications and papers related to reflection in medical education.

6. Voluntary Participation.
Your participation in this study is entirely voluntary. You may refuse to participate in this research. Such refusal will not have any negative consequences for you. If you begin to participate in the research, you may at any time, for any reason, discontinue your participation without any negative consequences.

7. Other considerations and questions. Please feel free to ask any questions about anything that seems unclear to you.

I have read or listened to the above information and I have decided that I will participate in the project described above. The researcher has explained the study to me and answered my questions. I know what will be asked of me. I understand that the purpose of the study is to better understand the use of reflection in medical education. If I don't participate, there will be no penalty or loss of rights. I can stop participating at any time, even after I have started.

Appendix G: Definitions of Reflection Used to Analyze Tutor Evaluation Items

Clinical Reasoning (doctor as expert):

- Problem and patient-oriented understanding, judgment and decision
- Key function of clinical reasoning is to solve a problem
- Aukes et al. (2007) thinks of this as Reflection-in-Action
- This is reflection related to a solving a patient's problem

Scientific Reflection (doctor as scholar):

- Critical appraisal of literature and own practice
- Ground in evidence and clinical epidemiology (Sackett et al., 1991)
- Key function of scientific reflection is optimizing scientifically-based clinical decisions or evidence-based medicine.
- Aukes et al. (2007) thinks of this as Reflection-on-Action.
- More technical view of reflection

Personal Reflection (doctor as person):

- Reflection on experience (own and others) in order to make sense/meaning.
- Aukes et al. calls this Reflection-on-Experience.
- Process of sense making about practice, thoughts, emotions, and beliefs.

General Reflection:

- A cyclic process of self-regulation (Korthagen, 2001; Driessen, 2005)
- A way for individuals to assess their own thinking and behavior in order to make adjustments.
- Used for descriptors that apply to all of three types of reflection outlined by Aukes et al. (2007).

Appendix H: Coding of Student Reflections: Levels of Mindfulness

#	*Level Name*	*Description*
0	Denial & Externalization	▪ Problem is "out there" ▪ May avoid responsibility ▪ May describe or reflect on the situation or patient in ways that are contrary to evidence
1	Imitation: Behavioral Modeling	▪ Does not necessarily use reflection ▪ Takes some responsibility for the situation ▪ Use external standards of behavior to solve problem ▪ Uses language indicating external standards but not internalized (made their own) ▪ Cites Rules without evidence of curiosity about the knowledge ▪ Language may indicate incomplete understanding ▪ May use passive language to refer to learning ▪ Inconsistent language
2	Curiosity: Cognitive Understanding	▪ Assumes explicit cognitive models guide physician's behavior ▪ Make decisions based on these models ▪ Indicate that the key to change is information transfer ▪ Talk about learning skills/science rather than connection between practice/practitioner and knowledge ▪ Discusses feelings, thoughts, and behaviors in terms of external standards ▪ No curiosity about own or pt's feelings, thoughts, and behaviors ▪ Does not go beyond knowledge transfer to discuss **nature of problem** or understanding **how to solve the problem**

#	*Level Name*	*Description*
3	Curiosity: Emotions & Attitudes	▪ Curiosity about feelings, thoughts, and behaviors ▪ No attempt to suppress or label them as good or bad ▪ Some discussion of inner life of self or patients ▪ Acknowledges/curious about emotions & attitudes but does not go beyond to **nature of problem** or understanding **how to solve the problem**
4	Insight	▪ Demonstrates understanding of the nature of a problem ▪ Understanding how one attempts to solve the problem ▪ Understanding interconnections between the practitioner and the knowledge s/he possesses ▪ Makes a distinction between knowing and understanding ▪ No explicit connection between insight and how it can be used in future practice
5	Generalization, Incorporation & Presence	▪ Uses insight to generalize ▪ Overcome similar challenges in the future ▪ Incorporate new behaviors and attitudes ▪ Express compassion ▪ Indicates presence ▪ Draws clear connection between insight and how it can be used in future situations ▪ Discussion of how an experience impacts how I want to practice

References

AAMC. (1998). *Learning objectives for medical student education: Guidelines for Schools*. Retrieved April 17, 2008 from http://www.aamc.org/meded/msop/msop1.pdf

ACGME. (2008). *Common program requirement.* Retrieved March 11, 2009 from. http://www.acgme.org/acWebsite/navPages/commonpr_documents/IVA5c_EducationalProgram_ACGMECompetencies_PBLI_Documentation.pdf

ACGME. (1999). *General Competencies*. Retrieved April 17, 2008 from www.acgme.org/outcome/comp

Argyris, C. (1980). *Inner contradictions of rigorous research*. New York: Academic Press.

Argyris, C. & Schön, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco: Jossey-Bass.

Astrom, G., Norberg, A., Hallberg, I. R., & Jansson, L. (1993). Experienced and skilled nurses' narratives and situations where caring action made a difference to the patient. *Scholarly Inquiry for Nursing Practice, 7*, 183-193.

Astrom, G., Norberg, A., Hallberg, I. R., & Jansson, L. (1993). Experienced and skilled nurses' narratives and situations where caring action made a difference to the patient. *Scholarly Inquiry for Nursing Practice*, *7*, 183-193.

Atkins, S. & Murphy, K. (1993). Reflection: A review of the literature. Journal of *Advanced Nursing, 18*, 1188-1192.

Aukes, L. A., Geertsma, J., Choen-Schotanus, J., Swierstra, R. P., & Slaets, J. P. J. (2007). The development of a scale to measure personal reflection in medical practice and education. *Medical Teacher, 29*, 177-182.

Baernstein, A. & Fryer-Edwards, K. (2003). Promoting reflection on professionalism: A comparison trail of educational interventions for medical students. *Academic Medicine, 78*(7), 742-747.

Becker, H., Greer, B., & Hughes, E. (1968). *Making the grade: The academic side of college life*. New York: Wiley & Sons.

Benner, P. (1991). The role of experience, narrative, and community in skilled ethical comportment. *Advances in Nursing Science, 14*(2), 1-21.

Benner, P., Tanner, C., & Chelsea, C. (1996). *Expertise in nursing practice: Caring, clinical judgment and ethics*. New York: Springer.

Berger, L. (2001). Inside out: Narrative autoethnography as a path toward rapport. *Qualitative Inquiry, 7*, 504-518.

Biggs, J. B. & Collis, K. F. (1982). *Evaluating the quality of learning: The SOLO taxonomy* (structure of the observed learning outcome). New York: Academic Press.

Boenink, A. D., Oderwald, A. K., De Jonge, P., Van Tilburg, W., & Smal, J. A. (2004). Assessing student reflection in medical practice. The development of an observer-rated instrument: Reliability, validity and initial experiences. *Medical Education, 38*, 368-377.

Borrell-Carrió, F., Suchman, A. L., & Epstein, R. M. (2004). The biopsychosocial model 25 years later: Principles, practice, and scientific inquiry. *Annals of Family Medicine, 2*(6), 576-582.

Boud, D. & Walker, D. (1998). Promoting reflection in professional courses: The challenge of context. *Studies in Higher Education, 23*, 191-214.

Boud, D., Keogh, R., & Walker, D. (1985). Promoting reflection in learning: A model. In R. Boud, R. Keogh, & D. Walker (Eds.) *Reflection: Turning experience into learning*. London: Kogan Page.

Brown, S. C. & Gills, M. A. (1999). Using reflective thinking to develop personal professional philosophies. *Journal of Nursing Education, 38*, 171-171.

Brunner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.

Coleman, H., Rogers, G. & King, J. (2002). Using portfolios to stimulate critical thinking in social work education. *Social Work Education, 21*(5), 583-595.

Coulehan, J. (2005). Today's professionalism: Engaging the mind but not the heart. *Academic Medicine, 80*, 892-898.

Creswell, J. W. & Miller, D. L. (2000). Determining validity in qualitative research. *Theory Into Practice, 39*(3); 124-130.

DeLyser, D. (2001). "Do you really live here?" Thoughts on insider research. *Geographical Review, 91*(1/2), pp.441-453.

Denzin, N. K., & Lincoln, Y. S. (2005). Introduction: The discipline and practice of qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research (3rd ed.)*, (pp. 1-32). Thousand Oaks, CA: Sage.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Chicago: Heath & Co.

Dobie, S. (2007). Viewpoint: Reflections on a well-traveled path: Self-Awareness, mindful practice, and relationship-centered care as foundations for medical education. *Academic Medicine, 82*(4), 422-427.

Driessen, E. K., Van Tartwijk, J., Overeem, K., Vermunt, J. D., & Van Der Vleuten, C.P.M. (2005). Conditions for successful reflection reflective use of portfolios in undergraduate medical education. *Medical Education, 39*, 1230-1235.

Ellis, C. (1999). Heartful autoethnography. *Qualitative Analysis, 9*, 669-683.

England, K. V. L. (1994). Getting personal: Reflexivity, positionality, and feminist research. *Professional Geographer, 46*(1), 80-89.

Engel, G. L. (1977). The need for a new medical model. *Science,* 196:129-136.

Epstein, R. M. (1999). Mindful practice. *Journal of the American Medical Association*, 282, 833-839.

Eraut, M. (1994). *Developing professional knowledge and competence*. Philadelphia: Falmer Press.

Fallows, S. & Chandramohan, B. (2001). Multiple approaches to assessment: Reflections on use of tutor, peer and self-assessment. *Teaching in Higher Education, 6*(2), 229-245.

Ferraro, J. M. (2000). *Reflective practice and professional development*. ERIC Digest retrieved 4/2/08 from www.ericdigests.org/2001-3/reflective.htm

Fund, Z., Court, D., & Kramarski, B. (2002). Construction and application of an evaluative tool to assess reflection in teacher-training courses. *Assessment and Evaluation in Higher Education, 27*(6), 485-499)

Gillian, M. & Strivens, J. (2000). Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education, 34*(7), 535–544.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory.* Chicago: Aldine

Glaze, J. E. (2001). Reflection as a transformative process: Student advanced nursing practitioners' experiences of developing reflective skills as part of an MSc programme. *Journal of Advanced Nursing, 34*, 639-647.

Glesne, C. (1999). *Becoming qualitative researchers: An introduction,* (pp.17-42). New York: Longman.

Greenwood, J. (1993). Reflective practice: A critique of the work of Argyris and Schön. *Journal of Advanced Nursing, 18*, 1183-1187.

Harris, I. (1993). New Expectations for Professional Competence. In L. Curry, J.F. Wergin, & Associates (Eds.), *Educating professionals: Responding to new expectations for competence and accountability* (pp. 17-52). San Francisco: Jossey-Bass.

Hatch, J. A. (2002). *Doing qualitative research in educational settings,* (p. 37-70). New York: State University of New York Press.

Hatton, N. & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation, *Teaching and Teacher Education, 11*(1), pp. 33-49.

Hilton, S.R. & Slotnick, H.B. (2005). Proto-professionalism: How professionalisation occurs across the continuum of medical education. *Medical Education, 39*, 58-65.

Hsieh, H.F. & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.

Hyrkas, E.L., Tarkka, M.T. & Paunonen-Ilmonen, M. (2001). Teacher candidates' reflective teaching and learning in a hospital setting—Changing the pattern of practical training: A challenge to growing into teacherhood. *Journal of Advanced Nursing, 33*, 503-511.

Infed (n.d.) *Reflection*. Informal Education retrieved February 23, 2008 from www.infed.org/biblio/b-reflect.htm

Isaacson, J.H., Salas, R., Koch, C. & McKenzie, M. (2008). Reflective writing in the competency-based curriculum at the Cleveland Clinic Leaner College of Medicine. *The Permanente Journal*, 12(2), 82-88.

Jarvis, P. (1987). *Adult learning in the social context*. London: Croom Helm.

Jarvis, P. (2006). *Towards a comprehensive theory of human learning*. New York: Routledge.

Jones, P.R. (1995). Hindsight bias in reflective practice: An empirical investigation. *Journal of Advanced Nursing, 21*, 783-788.

Kember, D., & Leung, D.Y.P. (2000). Development of a questionnaire to measure the level of reflective thinking. *Assessment and Evaluation of Higher Education, 25*, 381-389.

Kettle, B. & Sellars, N. (1996). The development of student teachers practical theory of teaching. *Teaching and teacher education, 12*(1), 1-24.

King, P.M. & Kitchener, K.S. (1994). *Developing reflective judgment: Understanding and promoting intellectual growth and critical thinking in adolescents and adults*. San Francisco: Jossey-Bass.

Kolb, D.A. & Fry, R. (1974). Toward an applied theory of experiential learning. In C. Cooper (Ed.): *Theories of Group Process.* London: John Wiley.

Korthagen, F.A.M. (2001). *Linking practice and theory*. Mahwah, NJ: Lawrence Erlbaum Associates.

Kuper, A., Reeves, S., Albert, M. & Hodges, B.D. (2007) Assessment: Do we need to broaden our methodological horizons? *Medical Education, 41*, 1121-1123.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* New York: Cambridge University Press.

LeCompte, M. D. (2000). Analyzing qualitative data. *Theory into Practice*, 39(3), 146-154.

Lincoln, Y. S., & Guba, E. G. (1985). Implementing the naturalistic inquiry. In Naturalistic Inquiry. London: Sage Publications.

Mamede, S. & Schmidt, H. G. (2004). The structure of reflective practice in medicine. Medical Education, 38,1302-1308.

Mamede, S. & Schmidt, H. G. (2005). The correlates of reflective practice in medicine. *Advances in Health Sciences Education, 10(4),327-337*.

Mamede, S., Schmidt, H. G., & Rikers, R. (2007). Diagnostic errors and reflective practice in medicine. *Journal of Evaluation in Clinical Practice, 13*(1), 138-45.

McLaughlin, M. W. & Marsh, D. D. (1978). Staff development and school change. *Teachers College Record, 80*(1), 69-94.

Merriam, S. B. (2001). *Qualitative research and case study applications in education.* San Francisco: Jossey-Bass.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.

Mitchell, R. (1994). The development of the cognitive behaviour survey to assess medical student learning. *Teaching and Learning Medicine, 6*, 161-67.

Mok, M. M. C., Lung, C. L., Cheng, D. P. W., Cheung, R. H. P. & Ng, M. L. (2006). Self-assessment in higher education: Experience in using a metacognitive approach in five case studies. *Assessment and Evaluation in Higher Education, 31*(4), 415-433.

Moon, J. A. (1999). *Reflection in learning and professional development*. London: Kogan Page.

Niemi, P. M. (1997). Medical students' professional identity: Self-reflection during the preclinical years. *Medical Education, 31*, 408-415.

Norman, G. R. & Schmidt, H. G. (1992). The psychological basis of problem-based learning: A review of the evidence. *Academic Medicine, 67*, 657–665.

Novack, D. H. & Epstein, R. M. (1999). Toward ceating physician-healers; Fostering medical students' self-awareness, personal growth, and well-being. *Academic Medicine, 74*(5), 516-520.

Oakeshott, M. (1962/1991). *Rationalism in politics and other essays*. Indianapolis, IN: Liberty Press.

Ogle, D. (1986). K-W-L: A teaching model that develops active reading in expository text. *The Reading Teacher, 39*, 564-576.

Paris, S. G. & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychology, 36*(2), 89-101.

Pearson, D. J. & Heywood, P. (2004). Portfolio use in general practice vocational training: A survey of GP registrars. *Medical Education, 38*, pp. 87-95.

Polanyi, M. (1964). *Personal knowledge: Toward a post-critical philosophy.* New York: Harper Collins.

Reimann, P. (2001). There is nothing as practical as theory: Or is there? *The American journal of psychology, 114*(2), pp. 308-321.

Richardson, L. (2000). Writing: A method of inquiry. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 923-948). Thousand Oaks, CA: Sage.

Richardson, L. & Lockridge, E. (2004). Travels with Ernest: Crossing the literary/sociological divide. Walnut Creek, CA: Altamira Press.

Sackett, D. L., Haynes R. B., Guyatt, G. H., & Tugwell, P. (1991). *Clinical Epidemiology: A Basic Science for Clinical Medicine*. 2nd ed. Boston, Mass: Little Brown & Co.

Scheffler, I. (1960). *The language of education*. Sprinfield, IL: Charles C. Thomas.

Schmidt, H. & Boshuizen, N. (1993). *On acquiring expertise in medicine*. Educational Psychology Review, 5, 1-17.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schön, D. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions.* San Francisco: Jossey-Bass.

Scott, P., Brown, A., Lunt, I. & Thorne, L. (2004). *Professional doctorates: Integrating professional and academic knowledge*. New York: Society for Research Into Higher Education and Open University Press.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences.* New York: Teachers College Press.

Sobral, D. T. (1995). Diagnostic ability of medical students in relation to their learning characteristics. *Medical Education, 29*, 278-82.

Sobral, D. T. (2000). An appraisal of medical students' reflections-in-learning. *Medical Education; 34*; 182-187.

Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Stanton, R. C., Mayer, L. D., Oriol, N. E., Treadway, K. K., & Tosteson, D. C. (2007). The mentored clinical casebook project at Harvard medical school. *Academic Medicine, 82*(5), 516-520.

Stewart, S. & Richardson, B. (2000). Reflection and its place in the curriculum on an undergraduate course: Should it be assessed? *Assessment and Evaluation in Higher Education, 25*(4), 369-380.

Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education; 45*(6), 204-11.

Tedlock, B. (2005). The observation of participation and the emergence of public ethnography. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research (3rd ed.)*, (pp. 467-481). Thousand Oaks, CA: Sage.

Tonelli, M. R. (1998). The philosophical limits of evidence-based medicine. *Academic Medicine, 73*(12), 1234-1240.

Weiss, P. M., Kollwer, C. A., Hess, L. W., & Wasser,T. (2005). How do medical student self-assessments compare with their final clerkship grades? *Medical Teacher, 27*(5), pp. 445-449.

Wertsch, J. & Rupert, L. (1993). The authority of cultural tools in a sociocultural approach to mediated agency. *Cognition and Instruction, 11*(3/4), 227-239.

Wertsch, J. V., del Rio, P., & Alverez, A. (1995). Sociocultural studies: History, action, and mediation. In J.V. Wertsch, P. del Rio, & A. Alverez (Eds.), *Sociocultural studies of mind.* New York: Cambridge University Press.

Wilkinson, T. J., Challis, M., Hobma, O., Newble, D. I., Parboosingh, J. T., Sibbald, R. G., & Wakeford, R. (2002). The use of portfolios for assessment of the competence and performance of doctors in practice. *Medical Education, 36*, 918-924.

Williams, B. (2001). Developing critical reflection for professional practice through problem-based learning. *Journal of Advanced Nursing, 34*(1), 27–34.

Williams, J. M. (2002). The engineering portfolio: Communication, reflection, and student learning outcomes assessment. *International Journal of Engineering Education, 18*(2), 199-207.

Wong, F. K. Y., Kember, D., Chung, L. Y. F., Yan, L. (1995). Assessing the level of student reflection from reflective journals. *Journal of Advanced Nursing, 22*, 48-57.

Woodward, H. (1998). Reflective journals and portfolios: Learning through assessment. *Assessment and Evaluation in Higher Education, 23*(4), 415-423.

Yin, R. K. (2003). *Case study research: Design and methods (3rd ed)*, Applied Social Research Methods Series, Vol 5. Thousand Oaks, CA: Sage.

VITA

Melissa Dawne Griggs grew up in St. Louis, Missouri and spent most of her adult life in Columbia, Missouri. She earned her bachelors degree in counseling psychology in 1992 and a master's degree in Rehabilitation Counseling in 1999, and a Doctorate of Philosophy in Educational Leadership and Policy Analysis- Higher Education in 2009. For ten years she worked with adults and children with developmental disabilities in various capacities. For the last several years she has been working in medical education with a focus on student and program evaluation.