2015

Reflective Judgment: Can Problem-Based Learning Approach Make a Difference?

Nicole Marie Cavanagh
University of South Carolina

REFLECTIVE JUDGMENT: CAN PROBLEM-BASED LEARNING APPROACH MAKE A DIFFERENCE?

by

Nicole Marie Cavanagh

Bachelor of Arts Interdisciplinary Science
University of South Carolina, 1996

Master of Social Work
University of South Carolina, 2000

Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Philosophy in

Counseling Education and Supervision

College of Education

University of South Carolina

2015

Accepted by:

Joshua Gold, Major Professor

Ryan Carlson, Committee Member

Moody Crews, Committee Member

Melissa Reitmeier, Committee Member

Lacy Ford, Senior Vice Provost and Dean of Graduate Studies

DEDICATION

I would like to dedicate this dissertation to my parents, Ted and Kaz Dickson, it is through all your sacrifices, unwavering support, unconditional love and forgiveness, which has helped shape the landscape on which I build all my successes and blessings.

To my children Jessica, Cody and most recently, Anson. You have made me want to work harder, achieve more and love deeper. I want you to want more for yourselves, *and* I wanted to be able to prove to you that you are never too old to get it.

My best friend Phyllis; thank you for your prayers, encouragement and support. You believed I could kick this dissertations' butt even when I thought I would never get it done.

Finally, to my ever-patient husband, Vince. Thank you for the late nights, take-out dinners, and lost moments that you graciously sacrificed so that I could have this small victory. You are my heart, and I thank God that not only did I find someone to love but that He let you love me back. I plan to spend the rest of life repaying everyone who gave to me, so that I could have so much to be grateful for.

ACKNOWLEDGEMENTS

How do begin to thank someone who has given you something that can never be repaid? My heartfelt thanks go out to my friends, colleagues, and co-workers who have suffered many a long hours listening to my progress in this endeavor. Thank you to the prayer warriors who provided me with encouragement and my "ride or die" friends who kept my spirits up and reminded me that regardless of the outcome, I was worthy of their love.

I would also like to thank my committee members, Drs. Moody Crews, Ryan Carlson and Melissa Reitmeier who served as the well-oiled machine that kept me on task and on point.

Finally, to my dissertation chair, Joshua Gold, I want to thank you for being "on-it" every step of the way. You provided me with just the right amount of encouragement and timely and concise feedback. I appreciate your honesty and support while I inundated you with a multitude of questions. You promised you were would be with me every step of the way and I am forever grateful that you kept that promise. Thank you for making me feel like I was your sole and favorite PhD candidate.

ABSTRACT

For counselors to be successful in current and future practice, they must be proficient reflective thinkers and be able to use reflective judgment skills to manage the daily complex problems presented by complex clients. Reflective thinking and reflective judgment are not elements of counseling curricula unless faculty explicitly design learning activities to develop these skills.

This study examined the relationship between reflective judgment and problem-based learning (PBL) by comparing pretest and posttest scores on the Reasoning about Current Issues test. Data was collected from a convenience sample of graduate level Counselor Education Ed.S students at the University of South Carolina and the Counseling and Development students at Winthrop University. One-way repeated-measures ANOVA were used to analyze results from the RCI and descriptive statistics were used to describe the participants. The results of this study will help counselor educators in the training and evaluation of counselor education students.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

List of Abbreviations

ACA ..... American Counseling Association

CACREP ..... Council for Accreditation of Counseling & Related Educational Programs

PBL ..... Problem-Based Learning

RCI ..... Reasoning about Current Issues test

RJ ..... Reflective Judgment

RT ..... Reflective Thinking

CHAPTER 1

INTRODUCTION

Whatever failures I have known, whatever errors I have committed, whatever follies I have witnessed in public and private life, have been the consequences of action without thought. --Bernard Baruch

The practice of reflection has been identified as an important component of counselor development (Angeli & Valanides, 2009; Bourner, 2003; Griffith & Frieden; 2000). This importance is reflected in The Council for Accreditation of Counseling & Related Educational Programs (CACREP) 2009 Standards, which identifies skills and practices in each of the individual counselor training program standards. The following terms represent a summary of skills and practice in all the programs: "knowledge", "conceptualize", "identify and understand", "assess", "planning and organizing", "evaluate", "individualizes helping strategies and treatment modalities", "modify counseling systems…make them culturally appropriate", "analyzes", "apply and adhere", "recognize", "identify, select and provide", "assessing and managing", "select appropriate comprehensive assessment", and "design and implements (CACREP, 2009, p. 61-138). These skills and practices outline and support the CACREP vision in "preparing counseling and related professionals to provide services consistent with ideal of optimal human development" (CACREP, 2009, p.19).

Consequently, counseling students must be prepared to provide culturally sensitive, individualized, and competent care to their clients. Counselors often seek to

understand their client's lives to apply counseling theory and provide appropriate interventions. These tasks require counselors (upon initial and subsequent assessments) to access their conceptions about the nature of their clinical knowledge; whereupon counselors develop a working hypothesis describing client issues, etiology, goals and interventions. These course-learned competencies are then exposed to the veracity of a guided and carefully supervised clinical experience. On a graduate level, Counselor Education students are confronted with both personal and professional challenges during their internship. Some challenges Counselor Education students may encounter include establishing a counseling relationship, engaging in active listening, responding appropriately, and executing technical skills within the parameters of ethical practice (Urbani, et.al, 2002). As these practice skills and cognitive processing occur, students must integrate factual knowledge, generate and test hypotheses, plan and apply interventions, and evaluate treatment outcomes (Loganbill & Stoltenberg, 1993). Friedman and Schoen (2009) suggested that reflective judgment assists counselors in the conceptualization of the client's case and formation of a practice framework for treatment goals and intervention strategies.

Adding to this multifaceted process, clients as well as their problems are complex. It is the complexity of clients and their problems that Dewey (1933) asserted that: reflective judgments are initiated when an individual recognizes that there is controversy or doubt about a problem that cannot be answered by formal logic alone, and involves careful consideration of one's beliefs in light of supporting evidence. According to Crits-Christopher, Cooper, & Luborsky (2008), complex events and the extent to which the therapist elicited relevant data and integrated the information into a conceptualization on

the client's main problem were essential in positive treatment outcomes. Further studies indicated that when counselors fail to accurately conceptualize client "issues" (or fail to use good judgment), efficacy of the treatment intervention is lowered (Aston, 2009; Crits-Christoph, Cooper & Luborsky, 2008; Ridley, Mollen, & Kelly, 2011a). Successful treatment outcomes are rooted in the individualized integration of multiple judgments about a client's problem and goals, analysis of the causal and extraneous variables that influence them. Consequently, the level of reflective judgment of the counselor can affect the focus, strategies and results of treatment with a client (Eells, Lombart, Kendjelic, Turner, & Lucas, 2005; Haynes, Godoy, & Gavino, 2012).

Studies have found that counselors with higher levels of reflective judgment are better able to assess the complexity of issues and to find, use and evaluate information more effectively than those with lower levels of reflective judgment (Eriksen & McAulliffe, 2005; Ridley, Mollen & Kelly, 2011a; Ridley, Mollen & Kelly, 2011b; King & Kitchener, 1994; Owen, 2005). Thorton (2008) asserted that reflective judgment is synonymous with clinical judgment. Accordingly, he suggested that if reflective judgment is not developed, clinical judgments become the process of deductive reasoning where upon "answers" are derived only from available information to produce "the best answer". He asserted that this is not only irresponsible but also unethical practice. Therefore, the scientific study of the development of reflective judgment would seem to be critical to the promotion of ethical and efficacious counselors. Although many existing methods promote counseling performance skills, there are few established methods for teaching students the conceptualization skills needed to understand and treat clients (Eells et al., 2005; Griffith & Frieden, 2000; Kuhn & Dean, 2004).

Thus, further investigation of research over the last ten years on an approach to increase reflective judgment in Counselor Education students produced minimal results. However; in the fields of psychiatry (Crits-Christopher, Cooper, & Luborsky, 2008; Eells, et al, 2005; Thorton, 2008), social work (Altshuler, & Bosch, 2003; Potter & East, 2000) and education (Bourner, 2007; Many, Howard & Hoge, 2002; White, 2000) there were more studies readily available on the topic of increasing reflective judgment. The lack of research in counseling education within these specific parameters, while similar disciplines explore this research (with promising results) indicated that perhaps this research is not only relevant but needed (Kindsvatter & Desmond, 2013). It is hoped that the results may add to the body of existing knowledge and begin to fill the gaps in literature on a possible pedagogy to increase reflective judgment in Counselor Education students.

Problem Statement

Client treatment interventions require increasingly higher levels of cognitive processing skills (Aston, 2009) and today's counselors are expected to be able to provide competent care with clients whose situations are increasingly more complex (Eells, et. al 2005). Accredited Counselor Education programs are charged with the responsibility for training competent graduates who are able to function in ever-changing and culturally diverse environments (CACREP, 2009). The need for counselors to focus on increasing reflective judgment is echoed in several position statements citing the need for college graduates to think reflectively from authorities such as the American Psychological Association, Association of Higher Education and the American College Personal Association who have readdressed the need to focus towards the improvement of

reflective thinking (Griffith & Frieden, 2000). The Association of American Colleges also addressed the need for reflective judgment by stating:

> "[college] students need to learn… to be able to state why a question or argument is significant and for whom; determine what the difference is between developing and justifying a position and merely asserting one; and how to develop and apply warrants for their own interpretations and judgments" (cited by King and Kitchener, 1994, p. 19).

According to Dewey (1933), reflection involves "active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and the further consequences to which it leads" (p.9). Schönön (1987) suggested that counselors can use reflection to link counseling theory with clinical practice. Bourner (2003) further asserted that developing student's capacity for reflective thinking is part of developing their capacity to learn how to learn.

Considering the importance of judgment accuracy in the counseling profession, it seems logical that the introduction of an approach specifically directed to increase judgment early in a counselor's career would provide the counselor with a skill that should increase the accuracy of judgment decisions and yet there is very little available research on that topic (Owen, 2005). Additionally, according to research, the process of decision-making requires a level of cognitive maturity not typically demonstrated in the average graduate participant (King, 2000; King & Kitchener, 2004). According to Dawes (1989), graduate level participants struggled with differentiating between personal experiences and literature when evaluating the merit in what is true. In other words, participants believed that their lived experience or personal opinions could be used as fact

in determining outcomes for others. Participants based their decision-making on personal and academic knowledge, feedback, intuition and experience, which opened the door for potential mistakes or missed opportunities. Failure to critically examine all aspects of clients' challenges, may result in the construction of a superficial intervention, rather than an individualized plan which explores the complexity of both the client and their presenting problems (Haynes, Godoy, & Gavino, 2012).

Research indicated that faculty is interested in increased reflective judgment as a learning outcome; however, many believed that reflective thinking could not be addressed with the current resources available (Bissell & Lemons, 2006; Friedman, & Schoen, 2009). This would indicate that faculty might be more likely to implement a new/different teaching approach to increase reflective judgment if one were readily available. The current study intends to study change in reflective judgment level after a PBL approach is implemented. The results shall be timely and add to the available teaching and evaluation methods available for increasing reflective judgment. These will be discussed in further detail in Chapter 2.

Nature of the Study

The hypotheses for this study were developed based on the preceding literature review, which provided preliminary support for the efficacy of PBL in increasing reflective judgment. The current study hoped to answer the following research question: Is reflective judgment positively effected through the implementation of a problem-based learning approach?

While investigating this approach, consideration should be given to the following hypothesis from the scores on the Reasoning about Current Issues test (RCI):

1. Participants engaged in a Problem-based learning (PBL) teaching approach will increase their reflective judgment scores on the RCI between pretest and posttest.
2. Participants engaged in a PBL teaching approach will demonstrate a greater increase on their RCI scores over participants who are not engaged in a PBL approach.

Additional information on the nature of the study, including the design, instrumentation and procedures of the study will be discussed more in Chapter 3.

Purpose of the Study

The current study sought to focus on graduate level Counselor Education students' reflective judgment levels and the effects of a PBL approach. Specifically, the researcher hoped to answer the following research question: Is reflective judgment positively effected through the implementation of a PBL approach? The researcher wanted to study this area to contribute to the existing research available in this area as well as provide a possible alternative to existing teaching methods.

Theoretical Base

In considering the information to be gained by this study, the researcher chose to approach the study through the lens of a quantitative researcher. The researcher contemplated the possible implications of this study using a qualitative design and resolved to statistically explore the effects of PBL on Counselor Education students.

As a quasi-experimental design, the research was used to compare the outcome results from an experimental group against a control group after accounting for other

variables that may be related to the outcome. The specific approach used to analyze the research will be discussed in Chapter 3.

Several studies have been completed as a means for determining changes in reflective judgment using alternative methodologies (King, 2000; Owen, 2005; Potter & East, 2000; Yuen Lie Lim, 2009); however, limited research existed in the area of examining changes in reflective judgment using PBL. The researcher chose the Reasoning about Current Issues test (RCI) due to its high reliability and validity. Details of the instrument will be discussed in Chapter 3.

Operational Definitions

To account for variations in the definitions that may differ within the reading audience, the following terms and definitions were used in this study. To construct these operational definitions, the research utilized peer-reviewed literature and published documents from the American Counseling Association (ACA).

1. **Council for Accreditation of Counseling and Related Educational Programs (CACREP):** The Council for Accreditation of Counseling and Related Educational Programs provides recognition that the content and quality of graduate training program has been evaluated and meets all the standards set forth by the profession (CACREP, 2009).
2. **Ill-Structured Problems:** Problems which lack a clear-cut solution that cannot be reached by logic alone (King & Kitchener, 1994, p. xvi). They are designed to be complex and muddled and require multi-layered reasoning skills to solve (Schön, 1987). It is a term specifically and uniquely assigned to Problem-based learning.

3. **Participant(s)**: Generic term used for individuals who participated in studies referenced in this study.
4. **Student(s)**: Generic term used for individuals within the identified target population, prior to invitation to participate in study.
5. **Subject(s):** A specific term used for students who agreed to participate in this study.
6. **Problem-based Learning (PBL):** An active learning, participant-centered pedagogy in which participants process situational topics through experiential problem-solving (Albanese & Mitchell, 1993; Savery & Duffy, 1995).
7. **Reflective Judgment:** "The outcome of a developmental progression. While one must have both knowledge and reasoning skills to engage in reflective thinking, true reflective thinking presupposes that individuals hold the epistemic assumptions that allow them to understand and accept real uncertainty" (King & Kitchener, 1994, p. 17).
8. **Reflective Thinking:** An active, persistent, and careful consideration of any belief of supposed form of knowledge in the light of the grounds that support it and further conclusion to which it tends (Dewey,1933, p. 6). This construct is measured as scores on the Reasoning about Current Issues (description of tool will be further examined in chapter 2). For the purposes of the current study the terms *critical thinking* and *reflective thinking* are interchangeable unless otherwise noted in the study.

Assumptions, Limitations, Scope and Delimitations

Assumptions

There are some basic assumptions that must be made explicit in studying reflective judgment. Research supports the assumption that Counselor Education students in this study are developing as other students in similar programs in a predictable sequence throughout their program of study. Further, students can be taught to engage in reflective thinking and to question their assumptions about knowledge and evidence (Angeli & Valanides, 2009; King, 2000). Moreover, the development of reflective judgment is considered more of a complex stage of development rather than a linear (step by step) evolutionary process. Therefore, despite this being a one-time measure, the researcher made the assumption that the RCI score, which was used as a measure of reflective judgment for this study, was both reliable and valid for this specific use with specific population. It was also assumed that the subjects in this study understood the on-line tool and would answer the questions honestly and to the best of their ability.

Another assumption was that the professional role of the researcher wouldl not contaminate this quantitative study as potential threats to contamination were examined and controlled for in the approach section of this study.

Limitations

It must be understood that individuals do not function in one stage of reflective judgment exclusively at any given time, but across stages (King & Kitchener, 1994). Therefore, the measurement of reflective judgment used in this study was a snapshot of the subjects' development at a given point in time. Also, reflective judgment is assumed to increase as a function of education in general, not necessarily counseling education, so

it is difficult to determine the specific weight of counseling education on the development of reflective judgment. In addition, interpretation of the RCI score is reflective of a functional level of performance at the time tested as opposed to the subject's optimal level of epistemic performance (Stein, & Heikkienen, 2008).

The study was further limited as the research was conducted using a convenience sample of voluntary subjects drawn from graduate Counselor Education Programs and the intervention was incorporated into a part of the current counselor education teaching agenda for those days that it was implemented. Therefore, the results may not be generalizable beyond the specific population from which the sample was drawn. Other limitations relate to the psychometric properties of the instrument to be used in the study (RCI) and will be explored in the methods sections of this dissertation.

Scope

The scope of the current study included students enrolled in the graduate program of the Counselor Education Ed.S program at the University of South Carolina and the Counselor and Development program at Winthrop University during their internship and/or practicum semester. Although the scope of this study only encompassed subjects from two regional graduate programs, results from this study can offer recommendations for alternative or supplemental pedagogical methods used to current pedagogy.

Delimitations

A delimitation of this study is that participation has been limited to graduate students in the Counselor Education program at the University of South Carolina and the Counselor and Development program at Winthrop University. The representativeness of the sample may not be generalizable to other graduate counseling programs in the United

States. Further, the available sample size prior to participation meets the minimum of required subjects for this study. As such, attrition and non-participation may effect sample size and may negatively impact the results section with respect to meeting the requirements for statistical power. Further discussion of the limitations and delimitations will be presented in Chapter 5.

Significance of the Study

The researcher determined that the following areas were significant to the study: knowledge generation, professional application and social change.

Knowledge Generation

This study hoped to expand the available research on methodologies for increasing reflective judgment in graduate Counselor Education students. As previously stated, there are gaps in the research in this area for this specific population; however, available research does support the efficacy of treatment outcomes as reflective judgment is increased (Falvey, 2001; King & Kitchener, 1994**,** Thorton, 2008). Additionally, other Counselor Education programs may benefit from the addition of this study to the limited research base.

Professional Application

Counselor Education programs may benefit from this study in several ways. PBL may be introduced as an approach to improve supervision and the measurement of reflective judgment may be used as a standard to evaluate counselor competence. Further, as the other disciplines identified earlier (Education, Psychiatry, Social Work) have begun to immerse themselves in reflective judgment and problem-based learning, knowledge gained from this study, may also add to their existing research.

Social Change

Opportunities for social change may occur when the researcher finds significant changes in reflective judgment after applying a Problem-based learning approach. As programs strive to meet the accreditation requirements, institutional change may be shaped through the reexamination of best practices on pedagogies designed maximize student's reflective judgment in hopes to meet the changing needs of both students and their future clients. Through increased reflective judgment, students may become better consumers of their experiences and thus better advocates for their clients. Thus, the research may offer other options to consider in both pedagogy and competency evaluation.

Summary

The importance of clinical judgment is supported in the literature (Falvey, 2001; King & Kitchener, 1994**;** Thorton, 2008). Clinical judgments are used to assess clients as they present for treatment. Counselors utilize considerable time assessing clients' history and presenting problems, integrating theories and summarizing knowledge for clinical judgments and treatment plans.

One goal of higher education is to increase the complexity of how individuals think (Association for Assessment in Counseling, 2002). Accordingly, the Reasoning about Current Issues test has primarily been a useful way of measuring reflective judgment. This study sought to expand the use of Problem-based learning to counselor education and to evaluate its impact on reflective judgment. Additionally, as higher education institutions are charged with developing and implementing curricula that

enhance reflective thinking, it becomes imperative that old and new pedagogies are examined for not only viability, but also sustainability (King & Kitchener, 1994).

In response, the current study examined effects of changes in reflective judgment after implementing a PBL approach. Within Chapter 2, a literature review will be presented. Chapter 3 includes the research methodology used in this study and descriptions of the Reasoning about Current Issues test (RCI) procedures for data collection, analysis and limitations. The results of the study will be presented in Chapter 4. Chapter 5 will provide an interpretation of the findings and implications for future research studies based on these findings.

CHAPTER 2

LITERATURE REVIEW

The intent of this chapter is to offer an overview of the literature related to the effects of reflective judgment when presented with a problem-based-earning model. Current literature related to reflective judgment in counselor education programs was narrow in scope. Empirical research in this area was limited as well. Therefore, the following review addressed reflective judgment and the problem-based learning model as a signature pedagogy for counselor education students.

The review of the literature examined several areas: seminal studies on the development of cognitive constructs, reflective thinking as a process towards reflective judgment, competency in case conceptualization and its potential impact on treatment outcomes, specific methodologies to increase reflective judgment and, review of methods and tools to measure reflective judgment. The proposed measurement tool, The Reasoning about Current Issues test (RCI) will be discussed in detail in Chapter 3. Several of the studies in the literature review were presented from the perspectives of theoretical assumptions regarding the nature of how students learn and a review of best practices previously used. The areas discussed within the literature review were related to the variables in the study and associated with the research question.

Content and Organizational of Review

A review of the literature regarding reflective judgment resulted in a progression of common themes that guided and organized the review. An understanding of how

reflective judgments are formed, implemented and evaluated necessitated an understanding of cognitive development and the possible influencing variables on successful utilization of cognitive processes. The following chapter was organized on the following themes: development of cognitive constructs and theory, Reflective Judgment Model, discriminating reflective thinking, reflective judgment as an outcome, reflective thinking towards reflective judgment, competent case conceptualization, PBL as an approach, and assessing reflective judgment

Strategy Used for Searching the Literature

In conducting a literature review for the topic of reflective judgment and problem-based learning, the literature search began in the Thomas Cooper Library at the University of South Carolina. The online resources available through the library were utilized by the researcher as a means for accessing article databases and indexes and electronic resources. Key terms that were used in the search included: reflective judgment, problem-based learning, reflective thinking and case conceptualization, treatment outcomes and counselor/counseling. Primary search engines included ERIC (EBSCO) and Psych INFO. Moreover, professional journals such as Counselor Education and Supervision, Journal of Counseling, Journal of Integral Theory and Practice, Journal of Instructional Psychology and, The Clinical Supervisor, were utilized in the construction of the search for literature. Additionally, the Council for Accreditation of the Counseling and Related Educational Programs (CACREP) 2009 manual was used.

Development of Cognitive Constructs and Theory

In his seminal research, Dewey (1933) asserted that metacognition or "thinking about thinking" is an interrelated set of competencies for learning and thinking (p.24).

He further stated that cognition consists of four skills essential in successful thinking: (1) critical thinking, (2) reflective judgment, (3) problem-solving and, (4) decision-making. Once these skills are mastered, they help the individual figure out how to do a particular task or set of tasks and then make sure that the tasks or set of tasks are done correctly.

According to Flavell (1979), *metacognition* is the regulatory system that includes (a) knowledge, (b) experience, (c) goals and, (d) strategies. Metacognitive knowledge is stored knowledge or beliefs about (a) oneself and others, (b) tasks, (c) actions or strategies and, (d) how all these interact to affect the outcome of any intellectual undertaking. Knowledge is considered to be metacognitive (as opposed to just cognitive) if it is used in a strategic manner to meet a goal. Thus, Flavell's (1979) notion of metacognition worked to support the current study's suppositions of the complexity of case conceptualization.

Cognitive-developmental theories such as Piaget's (2008) and Fischer's (1980) overlap in areas with Dewey's (1933) theory about reflective thinking. They were designed to provide a framework to capture and perhaps more importantly, measure the essence of cognitive development. Although similar, Fischer's Skill Theory is significantly different from Piaget's differentiating with the following tenants:

- Specified levels of development similar to Piaget's, but specified that those developing levels only suggest the highest possible levels of functioning for any particular level.
- Cognition is active.
- During the course of any day, humans show a range of cognition- it is not fixed.

- Humans seldom function at their full potential for sustained periods of time.
- The entire cognitive range should be observed, not only the potential peaks.
- The complexity of a test subject's response to problems changes with the provided context, regardless of the source of the problem (Hofer & Pintrich, 2002).

In other words, test subjects are prone to good and bad "cognitive processing" days and results from any given test may not capture the full potential of the subject.

Fischer's (1980) theory embraced these differences and made them the focal point of examination, while the older theories, such as Piaget's (2008), could not address the differences with clarity (Stein & Heikkienen, 2008). Moreover, Skill Theory suggests that when individuals are presented with different concepts they begin to compare/contrast them. As individuals increase in levels of functioning they begin to group concepts together, thus creating new understanding of conceptual structures or *schemas* (Stein & Heikkienen, 2008). Research has established that counselors use organized knowledge structures (schemas) to process information (Ridley, Mollen & Kelly, 2001b). These schemas may be based on: (a) theoretical orientation, (b) formal decision aids, (c) empirical evidence and, (d) clinical experience. These theories served as the underpinning for Fischer's theory which in turn served as the theoretical model for the Reflective Judgment Model (RJM).

Reflective Judgment Model

The logic of the procession to the development of the Reflective Judgment Model (RJM) can be easily seen as King and Kitchener (2004) used the following theorists and their theories to lay the ground work for their Reflective Judgment Model: Dewey

(definition of reflective thinking), Piaget (assumption of stage development); Flavell (stage model theories); Perry (sequential development of college participant's underlying assumptions about knowledge); Broughton (epistemological development); Fischer (cognitive skills theory); and Kegan (evolution of the self).

King and Kitchener (1994) asserted the notion that "not all problems can be solved with certainty" (p. 224). These problems are often complex and contain inconsistent information from various sources and require that the counselor decide on some course of action. These problems have been labeled as *ill-structured*. Ill-structured problems contain information that is ambiguous, and have multiple valid solutions.

Research by Owen (2005), used the RJM and a Clinical Judgment Assessment scale (CJA) to assess clinical judgment in students enrolled in a counseling psychology program. Methodology included randomly assigned students to a control or experimental group. The experimental group was presented with a case-study. Students were evaluated on their confidence level in diagnostic ability, reflective judgment and accuracy of diagnosis. Findings indicated that reflective judgment methodology was impacted by case study methodology, however; limitations included lack of generalizability, sampling, sample size and variability in case study methodology implementation. To date, this is the only study targeting counseling students utilizing the RJM (although the study did not specifically study Counselor Education students). Limitations of this study provided the current study with support that chose problem-based learning over case-study methodology.

The RJM was designed to describe how people conceptualize the nature of knowledge and then based on that understanding, make judgments. The majority of the literature on the RJM focused on the validity of reflective judgment as a unique construct (King &Kitchener, 1994; 2004), the sequential development of reflective judgment (King, 2000; King & Kitchener, 1994) and group differences and similarities in reflective judgment scores (e.g. ethnicity, gender and age: King & Kitchener, 1994, 2004). This research was used to determine which specific variable of reflective thinking could be measured for the current study. As such, research has established that reflective judgment is a unique construct and can be quantitatively measured (Hofer & Pintrich, 2002; King & Kitchener, 1994, 2004).

King and Kitchener (2004), explained that the conceptual framework for the RJM began after 25 years of research and concluded with three observations:

- "There is striking difference in people's underlying assumptions about knowledge or epistemic knowledge; and
- these differences in assumptions are related to the way people make and justify judgments about ill-structured problems; and
- there is a developmental sequences in the patterns of responses and judgments about such problems" (p.6).

These assumptions are fundamental in accepting the Reflective Judgment Model. which will be used in the current study and as such, served as the theoretical framework on which this study was based. Additionally, they asserted that reflective judgment is the "outcome of developmental progression. While one must have both knowledge and reasoning skills to engage in reflective thinking, true reflective thinking presupposes that

individuals hold the epistemic assumptions that allow them to understand and accept uncertainty" (1994, p.17). Epistemic assumptions are individuals' beliefs about what they know, what they believe to be true, how they evaluate the reliability of the source(s) of that truth and how they make decisions based on those assumptions.

The conceptual framework for reflective judgment consists of a seven-stage developmental model. Movement between stages is assumed to be progressive and demonstrates an increased ability to integrate one's perception of knowledge and the justification of their beliefs. The stage descriptions are "abstractions of the assumptions and reasoning styles that are apparent in the individuals' reasoning" (King & Kitchener, 1994, p. 46). King and Kitchener (1994) asserted that thinking can only be considered *reflective* when the individual is considering ill-structured, ambiguous problems or dilemmas. Within each level of the RJM, individuals possess certain and precise explanations about knowledge and specific ways in which they justify their explanations about their knowledge. Stages are grouped into three levels: Pre-Reflective (Stages 1-3), Quasi-Reflective (Stages 4-5) and Reflective Thinkers (Stages 6-7). These levels are sequential and hierarchal, which assumes that previous stages serve as the foundation for the next stage. Thus, while no individual fits perfectly within a developmental stage perfectly, individuals must demonstrate attributes of the Pre-Reflective and Quasi-Reflective level as they move towards becoming a reflective thinker. Moreover, each level has unique qualities regarding knowledge and how individuals make decisions about, or justify what they believe to be true and accurate. A brief summary based on King and Kitchener (1994), of the Reflective Judgment Model can be found in Table 2.1.

Stage	View of Knowledge	Concept of Conceptualization
PRE-REFLECTIVE THINKERS		
1	• Thinking is concrete, simplistic, even child-like • Only believe what they see or read	• Does not justify thinking because there are no discrepancies in thought processes • Nothing is abstract
2	• Draw knowledge from their senses • Dogmatically believe what authorities tell them • Believe knowledge to be certain • Have extreme faith in authorities truth	• Do not deal with ambiguity • Only believe what authorities tell them
3	• Begin to believe that experts do not know everything • Still concrete in thinking, however; supplement knowledge with personal knowing when an expert is not available	• Understand that some problems have no certain answers • Ineffective with ill-structured problems, because they lack skills to seek answers
QUASI-REFLECTIVE THINKERS		
4	• Knowledge is uncertain and situational • Requires evidence/rational rather than opinions	• Believe that rational and evidence are unique and idiosyncratic to them • Only offered when it benefits them • Believe everyone is entitled to their own opinions
5	• Accept some uncertainty • Much of their knowing and filtering of information is based on context, situation and personal perception • Do not appreciate the weight of evidence in decision making	• Capable of some abstraction • Frequently context bound and used in the justification for their beliefs
REFLECTIVE THINKERS		
6	• Knowledge is actively constructed • Knowledge is rooted in relevant data	• Knowledge is re-evaluated when new information is provided • Able to make decisions on credible evidence and revisit decisions
7	• Seek out and examine evidence • Weight knowledge based on its credibility	• Confident and comfortable with all aspects of thinking, including construction, uncertainty ambiguity and use of evidence

Figure 2.1. *Summary of Reflective Judgment Stages*

Reflective Judgment scores are calculated and reported as a single number, which represent the current functioning stage of the participant. More on the reporting of test results can be found in Chapter 3.

Discriminating Reflective Thinking

In the process of performing a literature review, *critical thinking* appeared in the same context as *reflective thinking*. While reviewing the research for distinguishing factors between the two terms, research supported both the acceptance and elimination of research using these terms. Angeli & Valanides (2009) research pointed out that both critical and reflective thinking are active processes and although critical thinking and reflective thinking are related, research trended towards the examination of reflective thinking which involves a more introspective process whereby personal experiences and knowledge are combined to produce meaningful and thereby applicable options for various experiences. Another difference between critical and reflective thinking is the epistemic process by which individuals solve problems. King and Kitchener (1994), asserted that previous attempts to define critical thinking was predicated by the notion that problems are solved through an internal lens and did not account for individual differences in experiences or personal methodologies to problem solving.

Numerous studies included in this study address critical thinking and apply operational definitions similar to the definition used for this study: *self-reflection* (Angeli & Valanides, 2009), *generate new knowledge* (Bissell & Lemons, 2006) and, *justify recommendations* (Holloway & Guthro, 2011). However; King and Kitchener (2004) pointed out that often critical thinking can be defined as "Informal logic, applied to

thinking or problem slogan in which one questions assumptions, collects and evaluates data, reasons deductively or inductively to draw conclusion and make reasonable inferences" (p.8). For the purpose of this study, research that used critical thinking in these contexts would be inconsistent to the defined parameters of reflective thinking needed for this study and thus were eliminated from this review.

Dewey (1933) defined reflective thinking as an "active, persistent and careful consideration of any belief or supposed form of knowledge, on the grounds that support knowledge and further the conclusions to which knowledge leads" (p.9). He emphasized the need for the training of thought. He stated that humans are innately curious and strive for structure and orderliness and that without some formalized intervention to assist with problem-solving, individuals will move from inference into proof-based conclusions solely on the information given or experienced. His assertions contributed to the current study as they added to the theoretical concept of PBL and the need for individuals to make order of ill-structured problems.

Having established that reflective thinking is a complex concept, defined through operational lens of each discipline and evaluated through parameters set forth by each discipline's requirements, for the purpose of this study, the operational definition of reflective thinking will be defined as a:

> The consolidative critical self-reflection on one's own learning process. It involves the active seeking of big messages and understanding from various learning experiences. The capacity of the human minds to understand and create knowledge will differ according to different people (Griffith & Frieden, 2000, p. 84).

In summary, *critical thinking* involves a wide range of thinking skills leading toward desirable outcomes and *reflective thinking* focuses on the process of making judgments about what has happened what needs to be known prior to making decisions. Therefore, reflective thinking is important in prompting learning during complex problem situations because it provides subjects with an opportunity to step back and think about how they actually solve problems and how a particular set of problem solving strategies are appropriate for achieving their goals (Griffith & Frieden, 2000). This study contributed to the current study by clarifying the relationship between critical thinking and reflective thinking and further distinguishing the differences between the two. It added to the theoretical base and the development of premises outline in this study.

Reflective Thinking towards Reflective Judgment

Counselors work with complex individuals presenting with ill-structured problems that require more than selecting a right answer (Haynes, Godoy, & Gavino, 2012). The process by which this occurs can be placed within a developmental structure. This structure is contained within *Skill Theory,* which outlines not only the professional maturation of individuals but also the environmental contribution to the skill development (Fischer, 1980).

Bourner (2003) defined reflective thinking as "a process whereby an individual responds to the lived experience and cognitively reviews and explores the experience in such a way as to create and clarify meaning in terms of self" (p.270). It is through reflective thinking that reflective learning occurs. This reflective process in turn leads to increased self-awareness, increased sensitivity to the environment and change in conceptual perspective (Eells et al, 2005). In Schön's (1987) book, he further defined

reflection as "exploring and issues of concern, which is triggered by an experience" (p.56). Argyris and Schön (1974) proposed that reflective thinking in practice is different than problem-solving in a controlled environment, where real world practice presents structural complexities that do not present themselves in a classroom. King's (2000) research built on this notion, citing that reflective thinking goes beyond critical thinking as the individual must go beyond logic to assess and justify the actions resulting from such evaluation. In other words, the goal is not to get the *right answer*, the goal is *consistency* within a context of a particular situation. Thus, reflective thinking is a complicated process by which reflective judgment occurs.

Reflective judgment is a term coined by King and Kitchener (2004) as a theoretical response to various individuals' theories on cognitive development. Kitchener (1994) originally described three levels of cognition: "daily thoughts, meta-cognition, an epistemic cognition" (p. 6). King & Kitchener's (2004) findings on reflective judgment were the result of twenty years of research on epistemic cognition (King & Kitchener, 1994, 2004). Various studies serve to support the notion and validity of reflective judgment (Dawes, 1989; Owen, 2005; Potter & East, 2000; Thorton, 2008). They also contributed to the conceptualization of reflective judgment in terms of a developmental process. It shed light on the notion that reflective judgment can not only be enhanced, but also incrementally improved through a well-defined process.

Reflective Judgment as an Outcome

One of the most cited barriers to enhancing reflective thinking is the disagreement between educators of an agreed definition. This disagreement led to variations in operational definition and more importantly variations in which reflective thinking was

measured (Angeli & Valanides, 2009; Bissell & Lemons, 2009; Griffith & Frieden, 2000). There have been several scholars who have used phrases such as: *rooted in analy*sis (Angeli & Valanides, 1974); *directed thinking* (Lodewyk, 2013); *purposeful and goal directed* (Argyris & Schön, 1974); *macro-logic skills* (Ridley, Mollen & Kelly, 2011a); *ability to frame problems* (Bissell & Lemons, 2009); and *make correct inferences about data* (Bourner, 2003). Additionally, several studies asserted that although nursing, psychology, social work and, counseling are viewed as "clinical" disciplines, each discipline defined critical thinking uniquely to its professional needs, and thus critical thinking and reflective thinking were often interchangeable within these disciplines' literature (Bissell & Lemons, 2006; Cassarino, 2006).

After a detailed literature review, Kindsvatter & Desmond, (2013) summarized that as a result of several position statements citing the need for college graduates to think reflectively from authorities such as the *American Psychological Association*, *Association of Higher Education* and *American College Personnel Association* there was an increase in literature on critical and reflective thinking in the late 1980's and 1990's. Their research examined the relationship between clinical judgment and clinical experience. Their findings confirmed that clinical judgment and clinical experience were not positively related. They further asserted that clinical judgment is enhanced through: (a) clear feedback on identified problems and, (b) identification of potential illogical presumptions/assumptions. Although their study did not clearly define learning outcomes in the same context of the current study, it assisted in the conceptualization of a process by which students were given opportunities to process their assumptions, identify "self" in their presumptions and, examine the development of ill-structured problems which

were relatable and real. This also supported the use of PBL as a teaching method to increase reflective judgment.

In their study Hofer and Pintrich (2002) reviewed the various epistemological theories on how students think, their motivational level and the developmental process of thought. In their review, they suggested that there were areas that needed to be clearly defined and delineated to ensure that educational outcomes are rooted in a theory that not only explained learning, but addressed how learning is measured. Although this study did not address reflective judgment per se' it provided illumination to the potential challenges of charging higher education with the task of improving reflective thinking as an educational outcome. Further, it provided the parameters under which the current study was defined and implemented to ensure that specific outcomes could be measured.

Hesterbuerg (2005) explained the decision making process as "decisions about belief or action generally occur in the context of some problem and should have some basis" (p.179). His research challenged the process by which reflective thinking was assessed and cautioned against using reflective thinking measures as means to infer potential academic outcomes for students, especially if the assessment was linked to grades. This research covered both the technical aspects of and the motivational techniques used to increase reflective thinking by instructors. He concluded by saying that several qualitative measures of reflective thinking included multiple choice answers (to which many students were good "guessers"), however; these methods did not measure change or growth in critical thinking skills as it related to developmental growth. This research confirmed the current study's choice of focusing on reflective judgment as

outcome of reflective thinking. Thus, it set the stage for justification for the use of the Reasoning about Current Issues tool.

Unfortunately, as previously stated, there is limited applied research available on reflective thinking and curriculum development in counselor education literature. In review of applied research, studies examined not only how participants learned, but looked at methodologies that can be replicated and maximized learning outcomes (Carone & Burke, 2007; Dewey, 1933; Schön, 1987). The general consensus was that understanding preceded explanation. Savery & Duffy (2006) went on to posture that curriculum must include an experiential component.

Savery & Duffy (2006) asserted that despite individual expertise in critical and reflective thinking, curriculum development still remains the primary source of how reflective thinking is developed and nurtured. Their study asserted that teaching reflective thinking skills fell into two general categories: (1) General methodology and, (2) Infusion methodology. The general methodology teaches critical thinking separate from subject matter. The infusion methodology facilitates critical thinking as a concept embedded into subject matter. Their study utilized a quantitative pre-posttest experimental design. Reflective judgment was measured by the California Critical Thinking Skills Test (CCTST). Results showed that students who were assigned to the infused curriculum group out-performed the general methodology group. This study suggested that critical thinking can be quantitatively confirmed after a problem-based intervention is implemented. Therefore, the findings of this study provided a firm rationale for the current study by helping to confirm the notion that the effects PBL can be both quantitatively measured and reflective judgment can be changed utilizing PBL.

In a study by Kuhn and Dean (2004), the development of pedagogical techniques to facilitate and evaluate reflective thinking may have stemmed from the lack of confidence that faculty had in critical thinking as a learning outcome. Faculty felt reflective thinking was difficult to assess due to the lack of user-friendly instrumentation and the perceived amount of time it takes to effectively implement these techniques. Supporting this notion, Cassarino's (2006) research stated that variations in terminology and operational definitions made it difficult for educators to identify what they were supposed to measure and thus added to their frustrations in their ability to document that they implemented techniques, which enhanced reflective thinking. Further, the classroom time needed to implement any pedagogy took away "valuable" teaching time from their structured lesson plans. Thus, to avoid the concerns expressed by the above cited research (time and value of intervention), the researcher chose to be the sole facilitator of the proposed intervention.

According to Hofer and Pintrich (1997) reflective judgments are beliefs about learning that significantly impact the quality of learning strategies and learning outcomes in general. Further, reflective judgment skills that were more developed were more likely to produce better treatment outcomes. They also asserted that "not all knowledge embedded in expertise can be captured in theoretical propositions or analytic strategies that depend on identifying all the elements that go into a decision" (p.94). In other words, some knowledge had to be experienced. Literature agreed that a successful facilitation of any methodology to stimulate reflective thinking thus increasing reflective judgment must include presenting an intellectual challenge just past the participant's abilities versus focusing on participant readiness (King & Kitchener, 1994; Kuhn &

Dean, 2004). Eriksen & McAulliffe (2000) also found that an interactional methodology was essential to evaluate skill development. PBL is rooted in this premise.

In summary, there is limited literature available to learning outcomes as it related to reflective judgment (King, 2000). This section explored reflective judgment as an educational outcome. The research also noted that the variation in terminology and operational definitions, time management, and unclear objectives added to the difficulty of educators to implement strategies to increase reflective thinking.

Competent Case Conceptualization

Case formulation is broadly recognized as an essential skill for counselors and needed for this study as it serves as the foundational lens through which all client care is implemented (Aston, 2009). Dawes (1989) described formulation as the "heart of evidenced-based practice" (p.455). Further, Dawes (1989) added that formulation enhanced clinical effectiveness because symptoms and problems were understood and organized by a coherent theoretical structure. Crits-Christoph, Cooper, & Luborsky's (2008) study of 43 therapists and their clients found that interventions, which were well-formulated and consistent with client main wishes and responses, correlated significantly and to a moderately strong degree with treatment efficacy.

Quality of case conceptualization is defined in multiple dimensions such as: "degree of comprehensiveness, collaboration and complexity of the formulation and evidence that the clinician followed a systematic case formulation process" (Ridley, Mollen, & Kelly, 2011b, p.868). Their study concluded that clinicians used formulation primarily to summarize descriptive information rather than to integrate it into a hypothesis about the causes, precipitants and, maintaining influences of individual

problems. This decreased the likelihood of effective treatment outcomes for the participants' clients.

Falvey (2001) studied 25 mental health counselors (as part of a larger project on expertise in case formulation) and examined the cognitive factors that influenced case conceptualization. The study concluded that how clinicians elicited client information, weighed the value of that input, formulated hypothesis and utilized cognitive schemas significantly impacted treatment outcomes and client satisfaction. The study also found that counselors made judgments rather quickly (e.g. 3 minutes) and at times with little information. Further, counselors' judgment making processes were shown to be consistent over the course of therapy.

Although many existing methods promote counseling performance skills, there are few established methods for teaching students the conceptualizing skills needed to understand and treat clients (Haynes, Godoy & Gavino, 2012). Aston (2009) added, "that not to diminish the importance of counseling performance skills, research indicates that pedagogical methods to promote both counseling performance skills and conceptualization is optimal for maximizing treatment outcomes" (p. 72).

Variables such as type of problem, complexity and client factors influenced counselor efficacy (Aston, 2009; Eells et. al, 2005). Eells, et al (2005) proposed that case formulation should be seen as a necessary tool and that providing a working hypothesis about complex and contradictory information would help guide treatment. Eriksen & McAulliffe (2003) proposed that formulation in themselves may influence outcomes. They went on to assert that what is suggested in treatment is less about interventions/skills used and more about the process of developing a case formulation.

More specifically, what counselors do depends on their evolving conceptualization of clients and that training towards that conceptualization matters. Thorton (2008) echoed the notion that reflective judgment was synonymous with clinical judgment. Thus, this study chose to focus on the scientific study of a method used to enhance reflective judgment to promote ethical and efficacious counselors.

Case conceptualization and treatment planning are frequent and universal clinical judgment tasks of counselors (Falvey, 2001; Eells et. al., 2005). The literature on clinical judgment and information processing provided some consensus regarding decision-making under uncertainty (Loganbill & Stoltenberg, 1993). Specifically, the mind uses a variety of heuristics (i.e. cognitive shortcuts) to handle information overloads that are common in complex judgments. Because individual processing capacities are limited, these heuristics provide individuals the ability to reduce the complexity of problems by assessing probabilities based on a limited number of variables across many cases at the expense of considering all the variables relevant to one client (Schofield, White, & Fleuridas, 2007). In other words, counselors when faced with complex clients/problems, reduce the complexity of these client/problems but lumping similar problems together and focusing on the "major" issues. This clinical judgment process is a concern for many reasons, one of which is the ability to implement interventions based on a fully-informed investigative and integrative processes. Dawson (2008) added that thoughtful metacognitive processing occurred when the counselor was: (a) actively attending to information received from the client, (b) applying theoretical knowledge to the situation, and (c) deciding on optimal interventions to meet counseling objectives.

Urbani et al. (2002) study supported the notion of "short-cuts" defining several cognitive strategies that produced low levels of cognitive function:

- *Representativeness:* assessing the probability that a problem or symptom belongs in any conceptualization category. This rapid matching of symptoms and assigning diagnoses can result in functional attribution errors.
- *Confirmatory Bias:* seeing out information that supports initial hypothesis while ignoring information that may disprove that hypothesis.
- *Availability:* the ease with which similar cases and events are recalled. This may lead to premature case formulation or generalizing familiar symptoms as the same thing.
- *Illusory Correlation:* correlating traits and symptoms based on personal belief in the absence of objective criteria. Individual may have limited experience or knowledge.
- *Primary Effects:* rapid judgments based on very little data. Individuals who are over-confident in their abilities often use this as "I know what this is."
- *Anchoring Effects:* influences attributable to order of presentation of information or judgment. Individuals assume that the most important information is disclosed first and base all formulations from that perspective.

These short-cuts are part of an internal confirmation system that left unchecked, led counselors to premature or incorrect assumptions. While counselors acknowledged

that heuristics provided necessary and often useful templates for clinical decision-making, a surprising number of clinicians, even experts, were unable to verbalize the presence or potential impact that these specific strategies had on their decisions and more importantly, their clients (Urbani, Smith, & Maddux, 2002). As evidenced, case conceptualization is the result of a cognitive process that leads the counselor from a position of questioning to the action of treatment. Failure to fully execute reflective thinking may result in faulty judgments that negatively affect treatment outcomes. Thus establishing the need for not only identifying a methodology to improve reflective thinking as it relates to efficacious case conceptualization, but also the need to identify an outcome measure of the methodology. The current research intends to propose PBL approach to increase reflective judgment.

Problem-based learning as an Approach

Problem-based learning (PBL) is a constructivist approach to education that encourages participants to take an active role in their learning. PBL originated from the medical school of thought and now used in other schools of thought (Weshah, 2012). PBL deliberately provides participants with "ill-structured" problems before participants have been given the necessary information to solve these problems. Researchers have outlined varying theoretical assumptions, which will be discussed in the section. Researchers approach PBL from two sides; one that views PBL as an instructional method in combination with various other methods and the other - that views PBL as an "educational strategy" to be implemented throughout a curricula (Stewart, 1998, p. 38). These views are similar to the infused and general curricula outlined in Savery and Duffy's (1995) study previously discussed. Savery and Duffy (1995) added that problems

trigger cognitive dissonance which required reflective thought toward more complex reflective action. Their research added that as participants struggled with an ill-structured problems, they were presented with the challenge of how to organize their own biases, experiences and thoughts to make sense of the information they were considering. This compelled them to expand their comprehension from what was known to be factual; explored the significance of this knowledge and; then applied it to the problem.

PBL allows for participants to become better problem solvers not experts in solving a specific problem. There are two critical issues involved in presenting a problem. First, if the students are to engage in authentic problem solving, then they must own the problem. In other words, the problem must reflect a "real" situation. Second, in presenting the problem, the instructor must be certain that the data presented does not highlight critical factors in the case. Too often, and especially with case studies, the information provided was directive in nature and suggested that the problem must be solved within the contexts of the information provided rather than exploring all possibilities (Abdalla & Gaffar, 2011; Benson, 2012). The research was particularly helpful to the current study in the conceptualization of the development and implementation of PBL approach. While controlling for independent variables in the current study, particular attention needed to be focused on the neutrality of the problem so as to allow students to work through the process without any intended or unintended directives.

In the research by Stewart (1998), Barrows, the originator of PBL was cited for recommending four objectives that PBL accomplished more effectively than traditional pedagogical methodologies:

1. Knowledge was gained through problems the participant is likely to encounter;
2. Effective problem-solving included a multi-discipline approach;
3. Learning skills are developed as a result of self-directed activities, in which insight about individual learning needs and resources were gained; and
4. Through the previous approaches, motivation was increased through the use of clinically relevant information is used.

Further, a study by Carone and Burke (2007) found that successful implementation of PBL included: realistic ill-structured problems, problems must be beyond participants' current level of competence, and instructors served as consultants not problem solvers.

Angeli & Valanides (2009) found that the failure to explain the relationship between case study method and reflective judgment resulted from utilization of case study methodology and the measurement tool (rubrics) designed specifically for the study. Thus making the rubric inherent with reliability and validity concerns. The study also asserted that there was little research about how or why case method works. Further, case method did not prescribe to one particular theory therefore; learning outcomes were *solution-focused* rather than *process* focused. This study provided clear reasoning for the selection of PBL over case study approach.

Kindsvatter & Desmond's (2013) study asserted that participants would feel uncomfortable/resistant with PBL as it required them to move outside their comfort level of what was known to explore what must be known to recommend a solution. In their research, they reviewed the benefits of problem-based learning: experiential learning, self-directed learning, flexible learning, collaborative learning and motivational learning. The researchers reviewed the roles of the instructor as well as reviewed the goals of PBL.

Despite the narrow scope of the research, (as PBL was the only intervention addressed without review of limitations of this model), the research provided the current study with support and directives for implementation of PBL.

Conversely, Cassarino's (2006) applied dissertation examined PBL on critical thinking skills. After review of the literature, the study found little or no evidence that that PBL had impact on critical thinking. One of the study's limitations failed to exclude variables that addressed maturation. Using a qualitative design, 13 graduate students were observed and data recorded over a 12-week PBL course. Findings indicated that critical thinking skills were not impacted utilizing PBL, again, the study pointed out that they did not control for maturation. Although qualitative by design, the findings of this study contributed to the development of the methodology section of the current study to ensure that the maturation effect was controlled for in the design.

Yew and Schmidt (2012), examined how learning takes place in PBL and identified the relationships between the learning-oriented activities of students with their learning outcomes. The study utilized 35 students randomly assigned in control and experimental groups. Results showed that students who participated in a PBL course, led to higher achievement in the demonstration phase of their evaluations. Findings of the study are particularly of interest to the current study as the implications for increased skills demonstration after completion of a problem-based intervention is possible. Limitations of note are the small sample size as well as the validity of results based upon researcher bias.

Yuen Lie Lim, (2009), used a 16-item self-report questionnaire to measure four levels of reflective thinking habits on four cohorts of undergraduate college participants:

in-coming, first year, second year, and third year participants. The study examined three criteria: habitual action, reflection and critical reflection in a cross-sectional sampling of 48 students. Results yielded that PBL promoted the development of reflective thinking, particularly in first year participants with no significant development difference thereafter. The study also found that the level of reflection developed habituation in problem-solving strategies in a problem-based learning environment. Although relevant in demonstrating the effectiveness of PBL, it focuses on a model where PBL in deliberately infused into curriculum, rather than a specific enhancement to current pedagogical methodologies. The study also utilized a measurement developed specifically for the study, thus inherent with reliability and validity concerns. While this research focused on an infused curriculum design, the findings supported the incorporation (although not as statistically significant) of PBL as an enhancement to current pedagogical methodologies. Thus it provided support for the present study's research design.

Kindsvatter and Desmond (2013) found that pre-practicum trainees experienced significant gains in cognitive complexity when they began to put counseling skills into practice after participating in PBL. Findings showed that increased cognitive complexity was associated with increased empathy and autonomy, flexibility in approaches to counseling and, increased appreciation and tolerance for cultural differences.

Sungur, & Tekkaya, (2006) found that students in problem-based learning environments were found to have higher levels of intrinsic goals orientation, task value, use of elaboration learning strategies, critical thinking, metacognitive self-regulation, and effort regulation. The researchers suggested that problem-based learning

environments might have enhanced metacognitive skills relative to conventional instructional environments. Thus, based on the summary of research presented in this section, PBL method would be a good fit for the research parameters of this study.

Assessing Reflective Judgment

Reflective Judgment had been assessed through qualitative measures, such as the reflective judgment interview, reflective journaling and self-report assessments (Schön, 1987; Yuen Lie Lim, 2012). Research in cognitive development has shown that effectively making decisions about ill-structured intellectual problems was developmental and related to several variables (Friedman & Schoen, 2009). The qualitative nature of this methodology was helpful when looking toward theory development, however; these methods were often time consuming and costly (Orcher, 2005). The current study looked towards validation and application of an assessment tool that could be generalizable and user friendly to the population studied. Several measures were considered: Reasoning about Current Issues (RCI), International Critical Thinking Basic Concepts and Understanding Online Test, International Critical Thinking Test, Motivated Strategies for Learning Questionnaire (MSLQ) and the Lectical Reflective Judgment Assessment (LRJA). Stein and Heikkienen (2008) provided an excellent summary of the description for each measure. A summary of their findings are as follows:

- Lectical Reflective Judgment Assessment: Online assessment of reflective judgment skills. Provides reliable development scores as well as can be customized to the particular target group; however, for the purposes of this study is cost prohibitive for the sample size needed to provide generalizability.

- International Critical Thinking Basic Concepts and Understanding Online Test: An assessment of students' knowledge about critical thinking concepts- the extent to which they have learned these concept. It is not an assessment of critical thinking ability. Reliability information not provided.
- International Critical Thinking Test: A pen and paper assessment of critical thinking skill that can be adapted to any subject area. Scoring is done by instructors and it based on rubrics.
- Motivated Strategies for Learning Questionnaire (MSLQ): Designed to assess motivation and use of learning strategies for college students. Examines metacognition, cognition and resource management. Results are used to assist in identifying resource management strategies to improve self-regulated learning.
- Reasoning about Current Issues test (RCI): The RCI is an online assessment of the capacity to recognize and endorse statements that reflect the attributes of reflective thinking. There is a minimum fee of $1 per test. It is best used as an assessment of reflective judgment within and between groups (p.106).

Based on the research parameters for this study along with a review of the available literature on available measurements, the Reasoning about Current Issues test was chosen. Details on the RCI will be discussed in detail in Chapter 3.

Summary

A review of the selected literature sought to evaluate the extent to which reflective judgment can be influenced or changed through PBL. The review yielded minimal results exploring reflective judgment as a learning outcome with the majority of data collected through qualitative research. Additionally, the literature reviewed

provided evidence for the need and significance of the proposed research: (1) the research reviewed supports the need for educators to develop evidence-based strategies to promote and enhance reflective thinking in counselor education programs; (2) there is a limited number of studies on the outcomes of PBL who have used objective measures of reflective thinking; (3) students' ability to reason reflectively is related to their ability to reflect both on internal knowledge and external information; (4) reflective judgment is a process through which reflective judgment occurs; (5) effective reflective judgments produces effective case conceptualization; (6) effective case conceptualizations result in better treatment outcomes; (7) PBL is an effective method to increase reflective judgments; (8) the Reasoning about Current Issues test is a viable tool to measure reflective judgment.

This study addressed several gaps in counseling education literature. To date, the RCI has not been used to assess reflective thinking of Counselor Educations Students. The reality that the counseling process is primarily rooted in challenges that are ill-structured makes this particularly important. Finally, the claims regarding PBL as an effective strategy for increasing reasoning skills to counseling practice merit investigation.

The following chapter will discuss the research design and methodology used for the current study. Chapter 4 will explain the results of the study completed in Chapter 3. The implications of the current study will be examined in Chapter 5.

CHAPTER 3

METHODOLOGY

The purpose of the current chapter will be to explain how the researcher intends to examine the effects of PBL on the development of reflective judgment. Accordingly, this chapter will include sections on the current study's research design and methodology, the setting and sample, instrumentation, data collection, treatment process, analysis process, and participants' rights. The chapter will conclude with a summary and brief overview of the remaining chapters.

Research Design and Approach

For the current study, the researcher chose to conduct a study that was quantitative in nature. The study utilized a pre-posttest quasi-experimental design to examine the effects of PBL on the development of reflective judgment. There are several scholarly books that discuss research as it relates to the field of education (Mayers, 2013; Orcher, 2005; Tabachnick & Fidell, 2012). These books specifically address the topics of pretest-posttest design and the key components of this type of research design. Pretest-posttest designs are widely used in behavioral research, primarily for the purpose of comparing groups and/or measuring change resulting from experimental treatments (Dimitrov & Rumrill, 2003, Mayers, 2013). One of the key components of pretest-posttest designs a test is given *before* an experimental condition is carried out, followed by the same test *after* the experimental condition (Mayers, 2013). Given the parameters of the current study, a pretest-posttest design was used.

According to Dimitrov & Rumrill (2003), three types of pretest-posttest designs are most prevalent: (1) randomized Solomon four-group design, (2) randomized control-group pretest-posttest design, and (3) Nonrandomized control group pretest-posttest design (quasi-experimental). Nonrandomized control group pretest-posttest allows that participants are not randomly assigned and deals with intact groups without disrupting the existing research setting. This reduces the reactive effects of the experimental procedure, and therefore improves the external validity of the design. However, this design is more sensitive to internal validity problems due to interaction between such factors as selection and maturation, selection and history, and selection and pretesting. If there are posttest differences between groups, those may be attributable characteristics differences between groups rather than the intervention. Therefore, a nonrandomized control-group pretest-posttest (quasi-experimental) design best offered a framework from which the researcher could gain statistical insight into the effects of PBL on reflective judgment and provided analysis with a high level of confidence in the results. Threats to correct threats to internal and external validity using the selected design will be discussed later in this chapter.

The intent to gain data supporting the statistical significance of PBL approach on reflective judgment is attainable with a quantitative study. As outlined in the literature review, it is not only an expectation of counseling educators, but also a mandate that the curriculum includes methods to enhance reflective thinking in higher education (Angeli & Valanides, 2009). Although the findings of this study may only be generalizable to the specific populations from which the sample was drawn, the researcher chose to use a qualitative study in hopes to use finding for recommendations for training and evaluation.

Setting and Sample

Population

The targeted population for the current study included students actively enrolled in the Counselor Education Ed.S. program at the University of South Carolina and the Counseling and Development Program at Winthrop University.

According to the USC website:

> The Counselor Education Ed.S. degree program offers two areas of concentration leading to the degree of education specialist: one is in school counseling, and the other is in marriage and family counseling. In both cases, the program requires 66 hours and is accredited by the Council for the Accreditation of Counseling Related Educational Programs http://www.sc.edu/study/colleges_schools/education/study/graduate_studies/counselor_education.php.

These programs are described as follows:

- ***School Counseling Education, Ed.S.:*** The school counseling education specialist program fulfills the certification requirements for endorsement as a K-12 school counselor in South Carolina.
- ***Marriage, Couples and Family Counseling, Ed.S：*** Designed to prepare professional counselors to work in educational, mental health or human services settings, the marriage, couples and family counseling specialist program addresses a variety of issues in the context of relationships and families (College of Education Faculty, 2014).

According to the Winthrop University website:

> The Counseling and Development Program at Winthrop University provides an intellectually stimulating and supportive environment for the professional development of clinical mental health and school counselors who are committed to best practice in their roles as clinicians, advocates, and consultants. The program strives to prepare culturally competent, culturally sensitive, and ethical counselors to work effectively in a pluralistic society. The faculty designs and delivers academic and clinical experiences to all students in ways that recognize, respect and value the diversity of students' backgrounds, characteristics, beliefs, and abilities (http://www.winthrop.edu/graduateschool/default.aspx?id=3635).

The programs are defined as follows:

- *MEd Counseling and Development: Clinical Mental Health Counseling Concentration:* Upon receiving the M.Ed. in Counseling & Development, students will meet course requirements for eligibility to take the examination to become a National Board Certified Counselor (NCC) and to make application for the Licensed Professional Counselor (LPC) license (Winthrop University Faculty, 2014).
- *MEd Counseling and Development: School Counseling Concentration:* Students satisfactorily completing the School Counseling concentration requirements and receiving a passing score on the PRAXIS specialty examination will be eligible for licensure or certification as a school counselor (Winthrop University, Faculty, 2014).

Both the University of South Carolina and Winthrop University are CACREP accredited programs in good standing. The University of South Carolina had one cohort of students enrolled in their internship for the Spring 2015 semester. Winthrop University had students registered for both their practicum and internship courses for the Spring 2015 semester. According to CACREP (2009):

> Students must complete supervised practicum experiences that total a minimum of 100 clock hours over a minimum of a 10-week academic term. At least 40 clock hours of direct service with actual clients that contributes to the development of counseling skills. Internships require a completion of supervised internships of 600 clock hours with a minimum of 240 clock hours of direct service (p.44).

In summary, subjects enrolled in their internship will have approximately 40 hours of direct service over subjects enrolled in their practicum. As previous cited, in the study by Yuen Lie Lim, (2009), there is negligible difference between reflective judgment skills acquisition in first year college students and years thereafter. Further studies by King and Kitchener (1994) asserted that the reflective judgment of students enrolled in college show no significant difference in pretest scores. Therefore, pending analysis of data, it assumed that both practicum and internship students are equivalent at pretest.

At the request of the Program Coordinator of Counseling and Development at Winthrop University, the researcher introduced all experimental procedures as early in the Spring 2015 semester as possible, as counseling students will still be awaiting assignment of actual clients. Working with both programs under this provision allows

that internship students had a minimum of 40 hours of direct client interaction over the practicum students.

Sampling Method

For the current study two broad demographic variable domains, static and dynamic, were considered for subject selection. Specifically, the static and dynamic variables were considered to determine the sample. The static domain represents variables that a person does not choose and cannot easily change (e.g., age, gender, ethnicity). Previous research has found that Reflective Judgment scores do not vary as a function of age, gender, and race/ethnicity (King & Kitchener, 1994; Owen, 2005). And therefore, will only be used for descriptive data analysis.

The dynamic domain describes variables that participants chose and can, theoretically change (e.g. section of course, University and specialty). For the current study, research subjects were drawn from convenience sample. All students were considered and invited to participate in the current study.

Sample Size

The number of subjects deemed necessary for this current study was based on a G*Power analysis. Cohen (1998) stated that determining statistical power helps identify appropriate sample size to adequately reject the null hypothesis (Type I error). Thus, to determine an appropriate sample size it was necessary to select a power coefficient, determine the potential effect size and identify the number of independent variables in most analyses, and type of analyses (Cohen, 1998; Orcher, 2006; Mayer2013). A power coefficient of .80 was selected as a standard set by (Cohen, 1998; Orcher, 2005). G*Power analysis was used to estimate how many subjects were needed to achieve a

power of 0.80, where significance is $\underline{p} \leq .05$. The researcher needed to estimate the effect size that the researcher was trying to find. The researcher chose a recommended medium size effect of .5. These parameters where used for a repeated measures, within-between interaction test. Thus, the researcher needed to recruit at least 12 subjects to a medium effect of .5, using a significance level of 0.05 and a power of 0.8 to detect that effect for both Hypothesis One and Two.

Eligibility Criteria

The eligibility for study participation required the subjects at the University of South Carolina to be actively enrolled in the EDCE 805S and 805F course during the spring 2015 semester of their plan of study. Winthrop University subjects were actively enrolled in CSDV 610A, 610 B (practicum) and 612 (internship) course during the spring 2015 semester of their plan of study.

Characteristics of Sample

After requesting permission from several regional graduate counselor programs, permission was obtained from two participating universities, The University of South Carolina and Winthrop University. Both programs are CACREP accredited and in good standing. The available sample consisted of 100 potential subjects. The current study used a non-randomized convenience sampling method to assign students to either the experimental or comparison group. Course section size and schedule were considered for assignment. Demographic information will be collected from the RCI test site and will include: gender, birthdate, race, and ethnicity,

Group Assignment

Careful consideration was taken to ensure that upon initial assignment, group assignment was as equivalent as possible. Information regarding specific section demographics were unavailable prior to assignment, therefore, course sections were assigned based on professor preference, time/date of course and number of registered students. Winthrop University scheduled three (3) sections of the internship course on the same night with 36 registered students. These sections were taught by the same professor, who granted permission for the researcher provide PBL to her students. Thus, sections were assigned to the experimental group. The University of South Carolina had two sections of one internship course combined into a single group of 18 registered students. The instructor granted permission for the researcher to provide the PBL intervention to his class, thus this section was assigned to the experimental group. This resulted in a total of 53 possible subjects in the experimental group. All other sections were then assigned to the comparison group, with a total of 47 possible subjects. All instructors were notified of the procedure and granted permission to the researcher, via Program Directors (for each University) to access students for student participation in the study. Subjects within and between groups were analyzed to ensure equivalence between groups as will be discussed later in this chapter as well as in the limitations section of Chapter 4.

All subjects who participated in the pretest automatically received an invitation to participate in the posttest, a link to the website with log-on information and a reminder of their unique identifier two weeks after the closing of the pretest. All subjects had a two-week window between pretest and posttest. Follow-up notifications were e-mailed to the

subjects on one week prior to the posttest closing reminding students to complete the RCI test. Additional drawings for gift cards were added as incentives to complete the posttest by the closing date.

Treatment Procedures

Permission was obtained on August 23, 2014 from the administrators of the RCI to utilize the RCI test. A nominal fee of one dollar per test is charged per completed test, provided the data is added to their database. This fee was paid by the researcher. Sheila Thompson, the test administrator at the University of Denver, provided the researcher with the URL for the website, along with a user name, password and subject ID#s, which provided subjects with access to the online test.

Testing Procedures

Permission to conduct the research was received from The Internal Review Board (IRB) of the University of South Carolina on December 22, 2014. IRB approval from the University of South Carolina was forwarded to the program coordinators of both graduate programs.

Subjects were provided with a link to a the RCI test. The University of Denver manages this website and results from all participants in all studies were added to their agrggate data base, while anonymity of each student remained in tact. Upon entering the site, participants were asked to read the consent form and indicate their consent by checking the appropriate box. A brief questionnaire requested information regarding their study identifier, age, gender, and ethnicity. All fields were required in order to advance to the next section.

Once completed, subjects were granted access to the RCI test. Participants could reenter the website if they were unable to complete the test. Subjects had access to the site from their own computers at their convenience. The survey was available for a two-week period for each testing period. Each group was provided a separate link or ―collector so that the survey was still available for each group for a total of two weeks. At the end of the two-week period, specific subject ID's were no longer accessible to respondents. Data for the dependent variable of reflective judgment were collected through scores on the RCI test.

PBL Implementation Procedures

As recommended by several PBL studies, a specific set of procedures was utilized as part of the intervention procedures (Abdalla, & Gaffar,2011; Kindsvatter and Desmond, 2013; Munshi, 2012; Savery & Duffy, 2006). Problem-based Learning Procedures are summarized below with step by step instructions provided in Appendix E.

Procedures are divided into to two parts. The first part (session) included a scripted introduction, formation of groups and introduction of the dilemma. A large group discussion was facilitated by the researcher to talk about the statement and identify significant parts of the dilemma. Small group discussion included reflection of what was known and what needed to be known. A written summary was then developed by each small group with a list of all possible solutions. Action steps were then developed and placed on a timeline. Students were then asked to gather supplemental information regarding implementation of the possible solutions. The first step ended with a comprehensive recommendation. Students were asked to be prepared to provide any evidence to support their recommendation.

Step two included individual groups presenting their recommendation to the large group. The facilitator (researcher) then engaged students in a review of strengths and weaknesses of each group's recommendation. Finally, the session ended with a debriefing to review the procedure, initiate discussion on the participant's impression of the procedure and process the recommended outcomes.

Instrumentation and Materials

Reasoning about Current Issues

Developed by King and Kitchener (2002), **t**he Reasoning about Current Issues (RCI) test measures is an on-line, qualitative instrument that evaluates the recognition of tasks which supports the current research design. Designed using the Reflective Judgment Model, the RCI assesses the core assumptions that participants are accessing as they begin to resolve ill-structured problems. The RCI uses a Likert Scale format to represent single stages of reflective the reflective judgment model. Participants must address three ill-structured problems. These problems are reflective of current topics in which are embedded multiple perspectives. Examples of the ill-structured problems can be found in Appendix G. According to King and Kitchener (2002), each dilemma consists of four parts. Participants:

1. read the dilemma;
2. reply to an open-ended question through the rating of their opinion on a 5-point Likert scale (ex: What is the basis for your point of view on this issue?);
3. assess the similarity of personal points of views to epistemic states about the dilemma (ex: "Experts say that one view about the contribution of immigrants to

economic prosperity was better, but they would also say that this viewpoint was relative to particular way of understanding this issue" p.58);

4. rank three statements from the prior section that are most similar to their own beliefs.

The RCI scores range from 2 to 7, representing progressive stages of reflective judgment of the Reflective Judgment Model. Test Administrators score and weight individual answers to each dilemma and then scores are combined and reported as a single number affiliated with a stage of the Reflective Judgment Model. Stages are grouped into three levels: a) Pre Reflective Thinkers (Stages 1-3); b) Quasi Reflective Thinkers (Stages 4-5); and c) Reflective Thinkers (Stages 6-7). The current study was concerned with statistical change in reflective judgment scores following a single PBL approach intervention. Despite King and Kitchener's (1994) study which found that multiple interventions over an extended period of time (several semesters) yields statistically significant results in predicting group score changes between levels, the current study chose to focus solely on overall change in RCI scores following a single intervention, as it was unlikely that students would remain in the same sections for more than one semester.

In considering reliability and validity of the RCI, several studies supported the use of this scale to the current study.

Reliability. According to Tabachnick and Fidell (2012), coefficient alphas for global measurements should be ideally over .80, however; coefficient alphas over .70 are considered adequate. Internal consistency estimates for the RCI range from the mid .70s to low .80s depending on the sample (Owen, 2004).

Validity. King, Wood, and Mines (1990) suggest that one criterion for judging the validity of the RCI was to triangulate RCI results with the Reflective Judgment Interview results. The Reflective Judgment Interview was validated over 20 years ago through data collected from 8,000 undergraduate and graduate students. The correlation between the two instruments is .40 indicating that it measures a construct related, but not identical to Reflective Judgment.

Results from the RCI can be used in program evaluation as well as action research. This met with the current study goals. Presented research provides justification for the use of this tool for the current study.

Threats to Internal and External Validity

History and maturation did not affect internal validity as the time window was not long. The power analysis indicated that the number of responses yielded provided enough data to detect a significant main effect due to PBL teaching approach. Moreover, further data analyses were done to ensure internal validity was not affected due to the non-randomized, quasi-experimental design for the assignment of groups.

To minimize the threat of extraneous and confounding variables, three conditions were necessary for the researcher to claim PBL effected change in reflective judgment: (1) PBL and reflective judgment must be related, (2) Temporal Antecedence condition- or proper time order was established, and (3) the relationship between PBL and reflective judgment must not be attributable to any confounding, extraneous variables (Mayer, 2013; Orcher, 2006; Tabachnick & Fidell, 2012). Having met these conditions, a PBL teaching approach was implemented. Again, these conditions will be explored in Chapter 4 of this research.

The nonrandomized pretest-posttest quasi-experimental design enabled the researcher to execute the current study and provided parameters in which to explore possible threats to internal and external validity. Threats to internal and external validity were covered in this section and will be reviewed again in Chapter 4.

Data Collection

The data collection procedures used by the researcher consisted of an on-line test following a PBL teaching approach intervention. One hundred students received an invitation to participate (Appendix B). Students were asked to complete contact information and were given log-on information for the pretest. Along with the invitation, there was a statement of approval from the IRB, and explanation of the study, and instructions for completing the on-line test. Included in the on-line test was a brief demographic question survey. Subjects were asked to complete the demographic section asking age, gender, and ethnicity. All fields were required in order to advance to the next section.

Data Analysis

Data were analyzed using a variety of statistical techniques. All of the variables were studied and findings were reported. Descriptive statistics for RCI pretest scores and age, gender, race, and university. A one-way repeated-measures ANOVA was used to examine Hypothesis One and Hypothesis Two. The utilization of a one-way repeated-measures ANOVA was justified in the present study as the researcher was looking to assess the following parameters: (1) if there is a significant change from pretest to posttest; (2) if there is a significant difference between experimental and comparison groups; (3) if there is a significant interaction between time and group (Orcher, 2005).

The assumptions that must be met for a one-way repeated-measures ANOVA are sphericity, homogeneity of covariance, and normality (Orcher, 2005). Data were analyzed to determine whether or not the assumptions of normality, linearity and homogeneity of covariance were met using the EXPLORE procedure in SPSS. Mauchly's outcome for sphericity was not addressed as there were only two conditions analyzed (Mayers, 2013).

The hypothesis for this study were developed based on the preceding review of the literature, which provides preliminary support for the efficacy of PBL method in fostering reflective judgment, and the use of RCI to assess developmental changes in the epistemology that supports reflective judgment (King & Kitchener, 2004). The hypotheses were also supported in the literature regarding the use of RCI as a standardized measure to assess developmental growth in the stages of reflective judgment (King & Kitchener, 2004; Owen, 2005). The study examines the following hypothesis:

1. Participants engaged in a PBL (PBL) teaching intervention will increase their reflective judgment scores on the RCI between pretest and posttest.
2. Participants engaged in a PBL teaching intervention will demonstrate greater increases on their RCI scores than those who are not engaged in a PBL intervention.

Subjects' Rights

Protective Measures

Potential subjects for the current study were invited to participate through a face to face brief introduction, where students were briefed on the nature and parameters of the study and given the right of refusal to participate in the on-line survey. To minimize risk of undue influence, the RCI test did not hold any identifiable information for subjects

and a designated, secure email address was specifically created for this study. The demographic requirements did not have any identifiable information from the subjects. Therefore, the researcher was solely responsible for unique identifiers. Once the RCI posttest closes, any identifying information was destroyed.

Risks and Benefits/IRB

No risks to subjects were expected due to the nature of the data collection and exposure to the intervention. Aside from the time and energy to complete the on-line assessment, the RCI did pose any major risks to subjects. Any potential discomforts for subjects were minor as there is no grade associated with participation, and completion of the RCI was done at the convenience of the subjects' location choice and time. As a means for minimizing risks, no identifiable information was provided by the subjects. Before the current study began, an application to the IRB was submitted. The email of invitation included an attachment of IRB approval. While the study provided minimal compensation to the subjects, both comparison and experimental groups were included in any compensation. Subjects who self-selected to not participate in the RCI were the only ones excluded from the compensation. Possible benefits included exposure to PBL approach which may stimulate reflective thinking at a higher level once completed, thus possibly making these subjects better reflective thinkers in future academic requirements.

Human Subjects Approval

Before proceeding with the study, approval was sought from the University of South Carolina Institutional Review Board (IRB) (Appendix A). Following approval from USC-IRB voluntary approval was sought from program directors from each university program director prior to the course start date. Individual instructors were

forwarded an email in which the program director was cc'd. The purpose of the study, including the benefits and risk, was explained by the researcher and was also provided in writing (Appendix B). The voluntary nature of participation in the study and the fact that the subject could withdraw at any time with no repercussions was clearly explained. Subjects' confidentiality and anonymity was protected by coding of subjects and by protection of all data on the researcher's password protected personal computer and data storage device.

Summary

The intent of the current study was to examine the effects of PBL on reflective thinking in a graduate counseling program. The non-randomized, quasi-experimental design was discussed for potential threats to internal and external validity. The researcher obtained IRB approval, subject and instructor consent, provided a pretest link to the on-line RCI to all subjects, introduced an ill-structured dilemma utilizing a PBL approach to the experimental group, and provided a posttest link to the on-line RCI to all subjects. The researcher anticipated a positive causal effect between PBL and reflective judgment for the experimental group. Raw data received from the on-line RCI assessment was analyzed utilizing one-way repeated-measures ANOVA. Chapter 4 will present a summary of the findings of the study, and Chapter 5 will discuss the implications of this study regarding future research for counselor educators and an alternative viable pedagogy.

CHAPTER 4

RESULTS

The purpose of this quantitative study was to evaluate the effects of PBL on reflective judgment. The specific aim of this investigation was to examine whether graduate level counselor education students improved their reflective judgment scores following a problem-based learning intervention. For the purposes of this study, reflective judgment was defined as "an active, persistent, and careful consideration of any belief of supposed form of knowledge in the light of the grounds that support it and further conclusion to which it tends (Dewey, 1933, p. 6). This construct was measured utilizing the Reasoning about Current Issues tool designed by King and Kitchener (1994). The tool has been evaluated for both reliability and validity. Reliability and validity have been established as both appropriate and acceptable in the utilization of the tool. Thus establishing utilization of the RCI as a sufficient tool for measuring reflective judgment.

Data analyses were conducted utilizing the Statistical Package for the Social Sciences (SPSS) Version 22 to test each hypothesis. Data were analyzed using a variety of statistical techniques. Descriptive statistics for RCI pretest scores and age, gender, race, and University of origin were used. Data were also analyzed to determine whether or not assumptions of normality, linearity, and homoscedasticity were met using the EXPLORE procedure in SPSS. Independent *t*-tests were used to determine whether the experimental and comparison groups were equivalent at pretest on ratio levels variables such as scores and age. Further testing for nominal variables such as gender and race

were compared using Chi square procedures or Fischer's Exact Test when the categorical group numbers were too small.

To reduce the risk of a Type I error, a one-way repeated-measures ANOVA were used to determine differences between pre- and posttest scores on the RCI test for each group as well as to assess whether there were significant difference between the groups in the amount of change over the intervention period. To organize findings, this chapter will present a descriptive sample analysis and statistical analysis of each of the research hypotheses examined in the study.

Sample Analysis

Participants for the current study were drawn from a convenience sample consisting of graduate level counselor educations students from the University of South Carolina and Winthrop University. Both University Program Directors were contacted in order to obtain permission to invite students to participate in the current study. Upon receipt of approval, a total of 100 potential subjects were invited to participate in the current study. Of these potential subjects, a total of 80 subjects completed the RCI, yielding the researcher an 80% response rate from the 100 graduate level counselor education students who were provided an invitation to participate.

Study subjects were recruited through personal, face-to-face invitation by the researcher and through emails. In order to participate, subjects completed the consent form, logged into the on-line RCI site, and completed the RCI. Preliminary results of the data analyses were assessed for accuracy of the data and missing data. Statistical tests were run to ensure that all groups were equivalent at pretest. Results of the analysis will be discussed later in this section.

Demographics

Participants of the current study were drawn from two CACREP accredited counselor education program in South Carolina. The analyses included data from 80 subjects. All data were screened for accuracy of data entry, missing values, and outliers by examining frequency distribution and descriptive statistics using SPSS. Given parametric analytic techniques were to be used, data were also analyzed using EXPLORE procedures in SPSS. Kurtosis and skewness values were within normal ranges for all variables with exceptions of gender (positive skew of .350) and age (positive skew of .350). Kurtosis was significant for gender and age due to the homogeneity of the group on these variables.

Experimental Group. Non-probability, purposive sampling was used to accomplish the goals of this study. Participants were recruited from two regional universities. The Procedures section describes the methods used to recruit participants. As shown on table 4.1, the experimental group was predominately female (94%), White (50%) and traditionally aged (22-26) (76%). Efforts were not made to stratify the sample with regard to gender, age and race based on the findings of previous studies that gender and race did not significantly influence Reflective Judgment (King & Kitchener, 2002).

Comparison Group. Non-probability, purposive sampling was used to accomplish the goals of this study. Participants were recruited from two regional universities. The Procedures section describes the methods used to recruit participants. As shown on table 4.1, the comparison group was predominately female (93%), White (69%) and traditionally aged (22-26) (74%). Efforts were not made to stratify the sample with

regard to gender and race based on the findings of previous studies that gender, age and race did not significantly influence Reflective Judgment (King & Kitchener, 2002).

Table 4.1

Frequencies of Characteristics of Experimental and Comparison Groups

Demographic	Experimental group		Comparison Group	
Gender	N	%	N	%
Male	2	5.9	3	6.5
Female	32	94.1	43	93.5
Total	34	100	46	100
Age				
22-26	26	76.5	34	73.9
27-39	6	17.7	11	23.9
40 and up	2	5.8	1	2.2
Total	34	100	46	100
Race				
White	17	50	32	69.6
Black	14	41.2	10	21.7
AP	3	8.8	4	8.7
Total	34	100	46	100

As shown on table 4.2, 77.5% of participants identified themselves as Winthrop University and the remaining 22.5% of the students identified themselves from the University of South Carolina.

Table 4.2

Frequencies of Participants by University

	Frequency	Percent
USC	18	22.5
Winthrop	62	77.5
Total	80	100

Correlation between nominal variables (race, gender) and group assignment (comparison, experimental) using Chi-Square with two cells violating the assumption. These cells were analyzed using a Fischer's Exact Test. Both tests produced similar results that race and gender is not significantly different from group of assignment. Further, an independent *t*-test was conducted to compare mean scores between comparison and experimental pretest scores with equal variances assumed. Another independent t-test was then run to compare mean scores between comparison and experimental pretest score with age with equal variances assumed. Thus confirming previous studies that there is no significant difference for age, race, gender (King & Kitchener, 2002; Owen, 2005). Moreover, despite practicum students' inclusion in the comparison group, there is equal variance between experimental and comparison group RCI scores at pretest.

Research Hypotheses Analysis

The Reasoning about Current Issues test was utilized to collect data for the variables in the current study. The RCI is an on-line test which produces a score 2-7 on the reflective judgment model. Prior to posttest analysis, Data were analyzed to

determine whether or not assumptions of normality, linearity, and homoscedasticity were met using the EXPLORE procedure in SPSS. Results yielded no violations of these assumptions.

Hypothesis One

Hypothesis One stated that participants engaged in PBL teaching intervention will increase their reflective judgment scores on the RCI between pretest and posttest. A one-way repeated measures ANOVA was conducted to compare the reflective judgment scores on the Reasoning about Current Issues test at Time 1 (prior to the intervention) and Time 2 (following the intervention. No significant effect was found. Wilks' Lambda=.159, F(1,78)= 2.01, p≥,05. In other words, for the total subject sample, there was no significant effect from pretest to posttest RCI scores.

Further investigation for the results of the one-way repeated measures ANOVA was conducted to compare the reflective judgment scores on the Reasoning about Current Issues test between time and group type. A significant effect was found. Wilks' Lambda=..047, F(1,78)=4.06, p≥,05.

Results required a *post hoc* analysis to investigate which group (comparison or experimental) yielded this change. A *post hoc* Boneferroni analysis was conducted given the statistically significant omnibus ANOVA F test. The following pairs of groups were found to be significantly improved: experimental group M=.094, SD=.464. In other words, reflective judgment scores of experimental subjects increased from pretest to posttest, while the comparison group RCI pretest to posttest scores did not.

Hypothesis Two

Hypothesis Two stated participants engaged in PBL teaching intervention will demonstrate greater increases on their RCI posttest scores than those who are not engaged in a PBL intervention.

Results from the *post hoc* Boneferroni analysis indicated that the RCI scores of the comparison group (p=.159) did not statistically increase, however; results did indicate that the experimental group (p=.046) did significantly increase following a PBL teaching approach intervention. Thus supporting rejection of the null hypothesis.

Summary

The intent of the statistical analyses performed for the current study was to determine the effects of a PBL approach on the amount of learning as implied by mean differences between pre-and posttest scores. Two hypotheses were used to structure the study. Research data was collected from 86 graduate counselor education students enrolled at the University of South Carolina and Winthrop University. To analyze the data, a matched pair *t*-test and an independent *t*-test were employed by the researcher. In reviewing results from the matched pair t-test for the present study, both Hypothesis One and Hypothesis Two were supported. Experimental group posttest scores improved following a PBL teaching approach. Further, experimental posttest scores improved albeit a significantly small effect over the posttest scores of the comparison group. Chapter Five will examine the results within the framework of the existing literature. Implications for future research and practice will be explored. The power analysis indicated that the number of responses yielded provided enough data to detect a significant main effect due to PBL teaching approach. Results of data analysis indicate

that while a quantitative quasi-experimental study provided grounds for generalizability, sample size is relatively small and results may be difficult to generalize to other counselor education programs.

CHAPTER 5

DISCUSSION

This chapter provides a summary of the study and interpretation of the research findings. Limitations are defined by the researcher, as well as conclusions concerning each of the hypotheses. Implications for future practice and research are also discussed.

Overview

The current study endeavored to explore the effects of a PBL teaching approach on the reflective judgment of graduate counselor education students. For the purpose of this study, reflective judgment refers to the "outcome of developmental progression" (King & Kitchener, 1994, p. 17). Correlation between nominal variables (race, gender) and group assignment (comparison, experimental) using Chi-Square with two cells violating the assumption. These cells were analyzed using a Fischer's Exact Test. Both tests produced similar results that race and gender is not significantly different from group of assignment. Further, an independent *t*-test was conducted to compare mean scores between comparison and experimental pretest scores with equal variances assumed. Another independent t-test was then run to compare mean scores between comparison and experimental pretest score with age with equal variances assumed. Thus confirming previous studies that there is no significant difference for age, race, gender (King & Kitchener, 2002; Owen, 2005). Moreover, despite practicum students inclusion in the comparison group, there is equal variance between experimental

and comparison groups. Furthermore, while the sample analysis indicated that anomalies existed among the population, the overall sample was relatively homogenous in nature.

In reviewing results from the one-way repeated measures ANOVA conducted for the current study, both Hypothesis One and Hypothesis Two were supported. Experimental group posttest scores improved following a PBL teaching approach. Further, experimental posttest scores showed a statistically significant improvement over the posttest scores of the comparison group. The following section will offer detailed discussion of the findings within the context of the previously reviewed literature.

Hypotheses Discussion

For the current study, the SPSS software system was utilized to conduct the statistical analysis. Implementing an one-way repeated measures ANOVA analysis approach allowed the researcher to investigate if a PBL approach produced an increase in posttest RCI test scores for the experimental group. Following confirmation of Hypothesis One, further analysis was conducted to examine the statistical significance of the increase of RCI test posttest scores for the experimental group.

Hypothesis One

Hypothesis One stated that participants engaged in PBL teaching intervention will increase their reflective judgment scores on the RCI test between pretest and posttest. The results of an one-way repeated measures ANOVA was conducted to evaluate the impact of the PBL intervention on participants' reflective judgment on the RCI test.

Results of this hypothesis were consistent with previous research that stated that PBL teaching interventions increased reflective judgment (Angeli & Valanides, 2009;

Kindsvatter & Desmond, 2013). The findings from the current study indicate that PBL teaching interventions had a positive effect on reflective judgment scores. Accordingly, the results are consistent with previous research that advocates for problem-based learning teaching methods to improve rove reflective judgment (Stewart, 1998; Sungur & Tekkaya, 2006; Kindsvatter & Desmond, 2013).

Hypothesis Two

Hypothesis Two stated participants engaged in PBL teaching intervention will demonstrate greater increases on their RCI posttest scores than those who are not engaged in a PBL intervention. Results of an one-way repeated measures ANOVA found a significant difference between the means of the two groups

Results of this hypothesis are consistent with previous research that participants who receive PBL interventions will increase their reflective judgment scores. The findings from the current study indicate that PBL teaching interventions does have an effect on reflective judgment scores. Accordingly, the results are consistent with previous research that advocates for PBL teaching interventions to increaser reflective judgment (Stewart, 1998; Sungur & Tekkaya, 2006; Kindsvatter & Desmond, 2013).

Implications

The intent of the present study was to determine the effects of PBL teaching approach on reflective judgment scores in graduate counselor education students. Based on the review of the two hypothesis, the significant findings were:

1. Hypothesis One is supported as stated in Hypothesis One, participants engaged in PBL teaching intervention will increase their reflective judgment scores on the RCI between pretest and posttest.

2. Hypothesis Two is supported as stated in Hypothesis Two, participants engaged in PBL teaching intervention will demonstrate greater increases on their RCI posttest scores than those who are not engaged in a PBL intervention.

Closer examination of group pretest scores showed that both comparison and experimental groups placed both groups at Stage 4. People in Stage 4 will seek internal validation for their personal beliefs. When confronted with flawed thinking, their responses often appear to lack logical sense. They are confident in their justifications because they believe that everyone has a right to own and express their personal opinions. Further, they hold that all opinions whether expert or non-expert, carry the same weighted value in an argument. At a level of 4.35 for the comparison group and 4.33 for the experimental group, there is understanding that information ambiguous, neither the level of reflective judgment nor the validation for assertions is sufficient for making true, authentic reflective judgments. Individuals at this level may instead seek way to justify their knowing or argue against others views if they do match their own (King & Kitchener, 1994, 2004). The concern for counselor education students who are Quasi-Reflective in their judgments is once evidence is presented and conceptualized, they may fail to considered alternative perspectives or provide adequate weight to alternative data, even when provided by experts.

Posttest scores for both groups showed no movement towards the next stage. Specifically, comparison group scores were 4.33 and experimental groups were 4.34. Despite the statistically significant change for the experimental group, both groups remained solidly at Stage 4. King and Kitchener (1994, 2004) suggested that at a Quasi-Reflective level, individuals are below the level of reflective judgment necessary for

competent practitioners to construct knowledge and justify their beliefs about the validity of the evidence necessary to resolve ill-structured problems. The implications from these results merit continuation of research increasing reflective judgment. Based on the characteristics and justification of thought, this researcher believes that the minimum level of reflective judgment necessary for competence in counselor education students is *at least* Stage 6 Reflective Thinking. Individuals at this level are able to consider information utilizing current data and reliable sources towards the integration of processed knowledge into their practice behaviors. Results from the present study provide implications for current and future counselor education programs and educators along with future research in PBL teaching methodologies. These implications pertain to current counselor educators, programs and future counselors.

Implications for Future Practice

Based on the outcomes of the current study, future aims of counselor education programs should include ways to continue increasing opportunities to increase reflective judgment in counselor education students. Counselor education programs have a responsibility to meet the continuing needs of its counselors. This is echoed in CACREP's (2009) vision in "preparing counseling and related professionals to provide services consistent with ideal of optimal human development" (p.19). Studies support the notion that competent case conceptualization is key to competent practice and reflective judgment is essential in competent case conceptualization (Dewey, 1933; Friedman & Schoen 2009; Loganbill & Stoltenberg, 1993).

Knowledge Generation

Knowledge generated from this study supports the need to continue to explore a PBL approach towards increasing reflective judgment. A study by Owen (2012) also supports the need to increase reflective judgment in counselor education students. His study asserts that there is limited research on reflective judgment in the discipline of counselor education. This research adds to the limited base of knowledge in this area.

Additionally results of this study provide a viable option to present pedagogical methods offered in counselor education programs (Owen, 2005). One example of a demonstrated effective pedagogy to increase reflective judgment in disciplines such as social work, teaching and law is case study (King, 2000; Owen, 2005; Potter & East, 2000; Yuen Lie Lim, 2009). The gaps in research with regard to PBL and reflective judgment in counselor education students is well-documented and results from this study may assist in closing this gap (Falvey, 2001; King & Kitchener, 1994; Thorton, 2008).

Professional Application

Results from this study may be used to re-evaluate the benefits of a PBL infused curriculum, towards habituation in problem-solving strategies in a problem-based learning environment (Yuen Li Lim, 2009). The current study showed a statistically significant increase in reflective judgment following a single intervention, studies support that long-term interventions provide statistically significant increases in reflective judgment for participants (Dawes, 1989; Dawson, 2004; King & Kitchener, 1994). Long-term consistent application of PBL approach may yield positive results in improving reflective judgment.

Additionally, other disciplines have already begun to utilize PBL approaches with positive results towards improving reflective judgment (Altshuler, & Bosch, 2003;

Bourner, 2007; Crits-Christopher, Cooper, & Luborsky, 2008, Eells, et al., 2005; Many, Howard, & Hoge, 2002; Potter & east, 2000; Thorton, 2008; White, 2000). Building on the assertion that PBL approaches increase reflective judgment and increased reflective judgment improves case conceptualization, which in turn may improve client outcomes, investigation towards this trend merits further investigation.

Another implication for further study may include the opportunity for counselor educators and supervisors to examine the effects of intentionality of an applied pedagogy towards building counselor competence. Research in the areas of increasing reflective judgment for disciplines such as social work, teaching and law have provided these disciplines with alternative teaching methodologies such as case study methodology with positive results (King, 2000; Owen, 2005; Potter & East, 2000; Yuen Lie Lim, 2009). Including the examination of maturation of reflective judgement through a developmental model may also enhance this opportunity as counselor education students can be assessed individually to determine not only the reflective judgment level change but also the changes in counseling skills from a developmental perspective.

Moreover, results from this study provide educators with data that supports outcome-based results utilizing a standardized methodology, a single, comprehensive definition, and an on-line instrument, thus addressing educators concerns for relevance, ease of use and long-term benefits (Cassarino, 2006; King, 2000). Further, research supporting the relationship between reflective judgment and the ability to reason effectively when faced with ill-structured problems, the potential of the Reflective Judgment Model within counselor education to assess and target reasoning skills bears investigation (King & Kitchener, 1994, 2004).

Social Change

Results from this study may influence social change as counselor education programs begin to focus on client outcomes in graduate school. This notion requires that programs investigate pedagogies that may increase case conceptualization and begin implementing and more importantly measuring variables that contribute to this goal. Research supports that increased reflective judgment is a viable option towards this change (Bissell & Lemons, 2006; Cassarino, 2006).

Implications for Future Research

The current study contributed to the limited research on improving reflective judgment in counselor education students. While the results of this study indicates that the RCI test is an effective measure of assessing the effect of short-term educational interventions, it is recommended as a measure for assessing the baseline of reflective judgment. Further, King and Kitchener (2004) recommend its use for assessing group trends rather than individual performance. As such, a follow-up longitudinal study, whereby the RCI test tool is used at the beginning and end of the counselor education curriculum, is likely to provide a more accurate representation of reflective judgment growth.

Efforts to assess the effects of PBL teaching approach objectively should continue as previous research suggests that students' "perception of their own ability to think critically may not match up with their performance on objective measures" (Hesterbuerg, 2005, p. 111). A replication should ensure fidelity to PBL is evaluated and that time between pre and posttests are held constant for all participants. For example, efforts can be made to identify differences in style, use of questions, and classroom dynamics.

Because group dynamics and role of the instructor are important factors in student learning, an analysis of the classroom discussions may also yield information regarding instructor practices that foster reflective judgment though PBL discussions.

It may also be helpful in a follow-up study to use a secondary tool to measure reflective judgment to ensure validity of data received. Options for this purpose that were examined in the current study are as follows:

- Lectical Reflective Judgment Assessment: Online assessment of reflective judgment skills. Provides reliable development scores as well as can be customized to the particular target group; however for the purposes of this study is cost prohibitive for the sample size needed to provide generalizability (p.106).
- International Critical Thinking Basic Concepts and Understanding Online Test: An assessment of students' knowledge about critical thinking concepts- the extent to which they have learned these concept. It is not an assessment of critical thinking ability. Reliability information not provided.
- International Critical Thinking Test: A pen and paper assessment of critical thinking skill that can be adapted to any subject area. Scoring is done by instructors and it based on rubrics.
- Motivated Strategies for Learning Questionnaire (MSLQ): Designed to assess motivation and use of learning strategies for college students. Examines metacognition, cognition and resource management. Results are used to assist in identifying resource management strategies to improve self-regulated learning **(**Stein and Heikkienen, 2008)

- Reflective Judgment Interview (RJI): A qualitative measure utilizing the reflective judgment model and used in King and Kitchener's (1994) studies to assist in establishing reliability and validity for the RCI tool used in the current study.

Limitations

The present study included limitations that must be taken into account when analyzing the results. In examining the results of the data, there are limitations of portions of the research design. While the researcher followed all preliminary steps to conduct the study, caution should be taken when considering generalizations from the present study's results.

Some of the challenges of ensuring internal and external validity of research in educational settings have been well-documented in literature (Royse, et al., 2006). Although ideal, randomized comparison groups are rare in an educational setting due to student preference or convenience. Attempts were made by the researcher to control for extraneous variables such as: following a PBL script and utilizing a single administrator. Despite the perceived notion of maintaining consistency, variations in administration of PBL were not monitored.

Because random assignment was not possible a quasi-experimental design was used to attempt to eliminate alternative explanations (Royse, et al, 2006). Although the statistical analysis indicated that the two groups were not significantly different on any of the measures, the difference in the size of the sections of the groups had sections as small as six and as large as 17. Although the statistical procedures of one-way repeated measures ANOVA used are generally robust to unbalanced designs, the findings may not

be representative of student populations or other counselor education programs (Mayers, 2013).

Another limitation of the study included addressing missing data between pretest and posttest participants which rendered these subjects responses ineligible for analysis. Future studies may indicate an opportunity to focus on reasons/causes for missing data.

Instrumentation

One of the primary challenges faced when conducting research is assess changes in reflective judgment as a result of an educational intervention is the of measure with sufficient sensitivity to detect changes in epistemology, which research has shown develops slowly. While research indicates that reflective judgment is associated with educational experience, King and Kitchener (1994), cautioned that interventions that continue for several semesters are more likely to have a measureable effect on student's epistemology, however; interventions that are less than this recommended amount have demonstrated statistically significant results. Therefore, one significant limitation of the current study was reflective judgment was assessed after a single intervention. In other words, despite success in rejecting the null hypothesis for this study, results without replication, appear at best a positive phenomenon.

Sample Size

One method for increasing power is substantially increase sample size. Given the financial limitations and despite invitations to several programs within the targeted region, only two programs consented to participate. Although efforts were made to secure as much participation as possible by personally recruiting students, offering

incentives, and sending reminders, the sample was significantly smaller than anticipated and further impacted by attrition. To allow the results to be generalizable to counselor education programs, caution must be exercised when using the findings of the quantitative analysis to draw conclusions.

Equivalence of Qualitative Posttest Measure

This study used a quasi-experimental approach in order to maximize the potential sample size. This included using two different universities. Due to scheduling and inclement weather, two of the experimental groups had more than two-weeks between pretest and posttest. Although no research can be found to support the potential confounding effect (positive or negative) of the increased time between pretest and posttest, the data does support that there is no statistical impact from this delay; however; as an unexpected delay, the researcher felt compelled to document this event.

Fidelity to PBL approach

A significant limitation to the current study to assess the effect of a PBL approach on reflective judgment of participants is the lack of any measures regarding fidelity to the PBL model. Despite a single administrator of the approach to all experimental groups, group size, participation level, and interpersonal rapport between groups and administrator called that assumption into question. Further due to data collection methods, a post hoc omnibus test to examine the significant differences between sections could not be performed.

Integrity of Self-report

Another limitation is the lack of a social desirability scale for the RCI test. Therefore, it is noted that the data obtained from this study was obtained from

participants in "good faith" without anticipation of malice of test-taking procedures. Further, although it was explained to participants that survey results would remain confidential, participants may not have been honest when reporting demographic data. It is also possible that participants allowed others to complete the pretest and/or the posttest in their stead.

Conclusion

The current study investigated reflective judgment in graduate counselor education students at two regional CACREP accredited programs. This study examined the effects of a PBL teaching approach on reflective judgment scores using the RCI test as a standardized, on-line measurement of reflective judgment. Moreover, counselor education students reported their demographic information including gender, age, race, and University of origin. Results of the present study indicated:

1. There was a significant effect of reflective judgment RCI posttest scores following a PBL teaching approach.
2. There was a significant effect of reflective judgment scores between pretest and posttest following a PBL teaching approach.

As gatekeepers for the counseling profession, counselor educators are responsible for developing strategies that will prepare graduates to think reflectively when faced with complex, multi-layered problems. The purpose of this study was to evaluate the efficacy of PBL teaching approach in enhancing students' reflective judgment. While the results of this study supported the use of a PBL approach as effective in increasing reflective judgment scores, recommendations indicate that future research is still needed. Results from the current study can be used to add to the knowledge generation, professional

application, social change, as well as provide valuable insight into methodological changes for a replication study.

REFERENCES

Abdalla, M.E., & Gaffar, A. M. (2011). *The seven steps of Problem-based learning implementation: Tutor's manual.* Retrieved from: http//:www.academia.edu.

Albanese, M.A. & Mitchell, S. (1993). PBL: A review of the literature on its outcomes and implementation issues. *Academic Medicine, 68*, 52-81.

Altshuler, S.J., & Bosch, L.A. (2003). Problem-based learning in social work education. *Journal of Teaching in Social Work, 23*(1-2), 210-215.

Angeli, C., & Valanides, N. (2009). Instructional effects on critical thinking: Performance on ill-defined issues. *Learning and Instruction, 19*, 322-334.

Argyris C., & Schön D. (1974). *Theory in Practice.* San Francisco, CA: Jossey-Bass.

Aston, R, (2009). A literature review exploring the efficacy of case formations in clinical practice. What are the themes are pertinent issues? *The Cognitive Behaviour Therapist*, *2*, 63-74.

Benson, S. (2012). The Relative Merits of PBL in University education. *US-China Education Review, 4*, 424-430.

Bissell, A.N. & Lemons, P.P. (2006). A new method for assessing critical thinking in the classroom. *Bioscience, 56*, 66-72.

Bourner, T. (2003). Assessing reflective learning. *Education and training*, *45*, (267-272).

Carone, S.S., & Burke, E. J. (2007). Student judgments regarding the effectiveness of Problem-based learning project in a Rehabilitation Counseling program practicum. *Rehabilitation Education, 21*, 59-66.

Cassarino, C. A. (2006). *The impact of problem-based learning on critical thinking and problem-solving skills*. (EdD. Nova Southeastern University).

Cohen, J. (1999). *Statistical power analysis for the behavioral science.* Hillsdale, NJ: Erlbaum.

Council for Accreditation of Counseling and Related Educational Programs. (2009). *2009 Standards*. Alexandria, VA: Author.

Council for Accreditation of Counseling and Related Educational Programs. (2009). *2012 Annual Report*. Alexandria, VA: Author.

Crits-Christoph, P., Cooper, A., & Luborsky, L. (2008). The accuracy of therapist's interpretations and the outcome of dynamic psychotherapy. *Journal of Consulting and Clinical Psychology, 56* (4), 490-495.

Dawes, R. M. (1989). Experience and validity of clinical judgment: The illusionary correlation. *Behavioral Sciences and the Law, 7,* 457-467.

Dawson, T. L. (2002). A comparison of three developmental stage scoring systems. Journal of *Applied Measurement, 3*(2)*,* 146-189.

Dawson, T. L. (2004). Assessing intellectual development: Three approaches, one sequence. *Journal of Adult Development, 11*, 71-85

Dawson, T. L. (2008). *Metacognition and learning in adulthood: A literature review.* Northampton, MA: Developmental Testing Service, Inc.

Dawson-Tunik, T.L. (2006). The meaning and measurement of conceptual development in adulthood. *Cognitive Development, 18*, 61-78.

Dawson-Tunik, T.L. & Stein, Z. (2004). *Critical thinking Seminar pre and post assessment results.* Hatfield, MA: Developmental Testing Services, Inc.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educational process*. Lexington, MA: Heath.

Dimitrov, D.M., & Rumrill, D. (2003). Pretest-posttest designs and measurement of change. *Work, 20*, 159-165.

Eells, T.D., Lombart, K.G., Kendjelic, M., Turner, L.C., & Lucas, C.P. (2005). Case formulation and treatment concepts among novice, experienced, and expert cognitive-behavioral and psychodynamic therapists. *Psychotherapy Research, 13* (2), 187-204

Eriksen, K., & McAuliffe, G. (2003). A measure of counseling competence. *Counselor Education and Supervision, 43*, 120-133.

Falvey, J. E. (2001).Clinical judgment in case conceptualization and treatment planning across mental health disciplines. *Journal of Counseling & Development, 79*, 292-303.

Fischer, K. W. (1980). A theory of cognitive development: The control and construction of hierarchies of skill. *Psychological Review, 87*, 477-531.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-development inquiry. *American Psychologist, 34*(10), 906-911.

Friedman, A., & Schoen, L. (2009). Reflective practice interventions, raising the level of reflective judgment. *Action in teacher education*, *31*(2), 61-73.

Garb, H.N. (1998). Clinical judgment, clinical training, and professional experience. *Psychological Bulletin. 105*(3), 387-396.

Griffith, B.A., & Frieden, G. (2000). Facilitating reflective thinking in Counselor Education. *Counselor Education and Supervision*, *40*, 82-93.

Haynes S.N., Godoy, A., & Gavino, A. (2012). *Behavioral assessment and case formulation*. Hoboken, NJ: Wiley.

Hesterbuerg, L.H. (2005). *Evaluation of problem-based learning practice course: Do self-efficacy, critical thinking and assessment skills improve?* (Doctoral Dissertation). Retrieved from: http://search.proquest.com.pallas2.tcl.sc.edu/pqdtft/docview/304992325/fulltextPDF/3CACFE9B2FBF4F4APQ/3?accountid=13965

Hofer, B.K. & Pintrich, P.R. (2002). The development of epistemological theories: Beliefs about knowledge and knowing and their relations to learning. *Review of Educational Research, 67*, 88-140.

Holloway, S.M., Guthro, P.A. (2011). Teaching resistant novice educators to be critically reflective. *Studies in the Cultural Politics of Education, 32,* 29-41.

Kindsvatter, A., & Desmond, K. (2013). A problem-based approach to skill acquisition and cognitive complexity with pre-practicum supervisees. *The Clinical Supervisor, 32,* 212-223.

King, P. M. (2000). Learning to make reflective judgments. *New Directions for Teaching and Learning, 82,* 15-26.

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 Inc., Publishers.

King, P. M., Wood, P.K., & Mines, R.A. (1990). Critical thinking among college and graduate students. *Review of Higher Education, 13*(2), 168-183.

King, P.M., & Kitchener, K.S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational Psychologist, 39*(1), 5-18.

Kitchener, K.S. (1994). *Assessing reflective thinking within curricular contexts* (ERIC No. ED415751). Washington, D.C.: Fund for the Improvement of Postsecondary Education.

Kindsvatter, A. & Desmond, K.J. (2013). A problem-based approach to skill acquisition and cognitive complexity with pre-practicum supervisees. *The Clinical Supervisor, 32*, 212-223.

Kuhn, D. & Dean, J.D. (2004). Metacognition: A bridge between cognitive psychology and educational practice. *Theory into Practice, 43*(4), 268-273.

Lodewyk, K. R. (2013). Fostering critical thinking in Physical Education students. *Journal of Physical Education, Recreation & Dance, 80*, 12-18.

Loganbill, C., & Stoltenberg, C. (1993). The case conceptualization format: A training device for practicum. *Counselor Education and Supervision, 22*, 235-241.

Many, J. E., Howard, F., & Hoge, P. (2002). Epistemology and pre-service teacher education: How do beliefs about the knowledge affect our students' experiences? *English Education, 34*(4), 302-322.

Mayers, A. (2013). *Statistics and SPSS in Psychology*. Harlow, England: Pearson

Munshi, F. (2012). *Problem based learning manual*. Retrieved from http//:www.med-ed-on-line-org.

Owen, J. (2005). Counselors' reflective judgment: An examination of clinical judgment strategies. (Doctoral Dissertation). Retrieved from:

http://search.proquest.com.pallas2.tcl.sc.edu/pqdtft/docview/304993625/fulltextPDF/A61B80A382A74B54PQ/1?accountid=13965

Orcher, L. (2005). *Conducting research: Social and behavioral science method*s. Glendale, CA: Pyrecazk Publishing.

Piaget, J. (2008). *Human development*. Karger: Basel

Potter, C.C., & East, J. (2000). Developing reflective judgment through MSW education. *Journal of Teaching in Social Work, 20*, 21-235.

Ridley, C.R., Mollen, D., & Kelly, S.M. (2011a). Beyond microskills: Toward a model of counseling competence. *The Counseling Psychologist, 39,* 865-886.

Ridley, C.R., Mollen, D., & Kelly, S.M. (2011b). Counseling competence: Applications and implications of a model. *The Counseling Psychologist, 39*, 865-886.

Savery, J.R., & Duffy, T. M. (1995). Problem-based learning: An instructional model and its constructivist framework. *Educational Technology*, *35*(5), 31-38.

Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco: Jossey Bass.

Schofield, T.R., White, L.J., & Fleuridas, C. (2007). Training related to changes in behavior, case conceptualization, and therapeutic outcome. T*he Family Journal: Counseling and Therapy for Couples and Families, 5*(1)*,* 4-18.

Stein, Z., & Heikkienen, K. (2008). On operationalizing aspects of altitude: An introduction to the Lectical™ Assessment System for integral researchers. *Journal of Integral Theory and Practice 3*(1), 105-138.

Stepien, W., & Gallagher, S. (1993). Problem-based learning: As authentic as it gets. *Educational Leadership*, *50*(7), 25-28.

Stewart, J.B. (1998). Problem-based learning in Counsellor Education. *Canadian Journal of Counseling 32*(1), 37-49.

Sungur, S. & Tekkaya, C. (2006). Effects of problem-based learning and traditional instructors on self-regulated learning. *Journal of Educational Research, 99*, 307-317.

Tabachnick, B. G., & Fidell, L. S. (2012). *Using Multivariate Statistic, (6th).* New Jersey: Pearson.

Thorton, T. (2008). Values-based practice and reflective judgment. *Philosophy, Psychiatry, & Psychology*, *15*(2), 125-133.

USC Faculty (2013). *Counselor Education Website*. Retrieved from: http://www.sc.edu/study/colleges_schools/education/study/graduate_studies/counselor_education.php

Urbani, S., Smith, M.R., Maddux, C.D., Smaby, M. H., Torres-Rivera, E., & Crews, J. (2002). Skills based training and counseling. *Counselor Education & Supervision, 42*(2), 92-106.

Weshah, H.A. (2012). Measuring the effect of problem-based learning instructional program on reflective thinking development. *Journal of Instructional Psychology, 39*, 262-271,

White, B. C. (2000). Pre-service teachers' epistemology viewed through perspectives on problematic classroom situations. *Journal of Education for Teaching*, *26*(3), 279-305.

Winthrop Faculty. (2014). *The Counseling and Development Program*. Retrieved from: http://www.winthrop.edu/graduateschool/default.aspx?id=3635.

Yew, E. H., & Schmidt, H.G. (2012). What participants' learning in problem based learning: a process analysis. *Instructional Science, 40,* 371-395.

Yuen Lie Lim, L. (2009). A comparison of participants' reflective thinking across different years in a problem-based learning environment. *Instructional Science, 39*, 171-188.

APPENDIX A – IRB APPROVAL

UNIVERSITY OF SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH

APPROVAL LETTER for EXEMPT REVIEW

This is to certify that the research proposal: **Pro00041295**

Entitled: *An Evaluation of the Influence of Problem-based Learning on the Reflective Judgment of Counseling Students*

Submitted by:

Principal Investigator:	Nicole Cavanagh
College:	College of Social Work
Address:	Hamilton, 202
	Columbia, SC 29208

IRB was reviewed in accordance with 45 CFR 46.101(b)(**1**), the referenced study received an exemption from Human Research Subject Regulations on **1/8/2015.** No further action or institutional Review Board (IRB) oversight is required, as long as the project remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research protocol could result in a reclassification of the study and further review by the IRB.

Because this project was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

Research related records should be retained for a minimum of three (3) years after termination of the study.

The Office of Rese Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Arlene McWhorter at arlenem@sc.edu or (803) 777-7095.

Sincerely,

Lisa M. Johnson
IRB Manager

APPENDIX B – SUBJECT CONSENT FORMS

Invitation Letter

Study Title: **Reflective Judgment: Can Problem-based learning approach make a difference?**

Dear Potential Subjects,

My name is Nicole M. Cavanagh. I am a doctoral candidate in the Educational Studies Department at the University of South Carolina. I am conducting a research study as part of the requirements of my degree in Counselor Education and Supervision, and I would like to invite you to participate.

I am studying graduate students' reflective judgment levels using a problem-based learning approach. If you decide to participate, you will be asked to complete an on-line pretest and posttest assessment of your reflective judgment levels. The completion of the assessment will take place online using the *Reasoning about Current Issues* assessment. Most students complete this assessment in fifteen to twenty minutes. Responses to the survey will only be reviewed by members of the research team who will analyze them. They will then be destroyed.

Additionally, students who are selected for the intervention will receive the equivalent of three (3) hours of instruction using a problem-based learning method. I will come to your class and although student sections have been chosen for the study, individual students can choose not to participate in the problem-based learning exercise.

You will experience minimal discomfort when answering most of the questions; however, you do not have to answer any questions that you do not wish to. I expect students participating in the experimental group will show increases in reflective judgment, I do not anticipate any negative outcomes for either the control or experimental group. All students who complete both the pretest and the posttest will be entered in a drawing for a $50 gift card. We hope to introduce a viable option to current pedagogies

and that students in the graduate counseling programs will benefit from the results of this study.

Participation is confidential. Study information will be kept in a secure location at the University of South Carolina. The results of the study may be published or presented at professional meetings, but your identity will not be revealed. Participation is anonymous, which means that no one (not even the research team) will know who you are or what answers you chose.

Taking part in the study is your decision. You do not have to be in this study if you do not want to. You may also quit being in the study at any time or decide not to answer any question you are not comfortable answering.

We will be happy to answer any questions you have about the study. You may contact me at nickcava@email.sc.edu or 803-777-0433 or my faculty advisor, Dr. Joshua Gold at josgold@mailbox.sc.edu or 803- 777-1936 if you have study related questions or problems. If you have any questions about your rights as a research subject, you may contact the Office of Research Compliance at the University of South Carolina at 803-777-7095.

Thank you for your consideration.

With kind regards,

Nicole M. Cavanagh, Doctoral Candidate in the Department of Educational Studies
261 Wardlaw Hall
The University of South Carolina
Columbia, SC 29208

1. http://www.reflectivejudgment.org/
2. **INSTITUTION:** University of South Carolina
3. **PASSWORD**: Gamecocks.
4. **SUBJECT ID#** can be found at the bottom of this page.
5. **You have two weeks from receipt of this letter to complete the pretest**

CONSENT FORM

If you would like to participate, please log onto the website below and follow the remaining steps:

6. http://www.reflectivejudgment.org/
7. **INSTITUTION:** University of South Carolina
8. **PASSWORD**: Gamecocks.
9. **SUBJECT ID#** can be found at the bottom of this page.
10. **Complete the online version of the assessment by 11:00 am 2/9/14**

You will need it to complete the posttest when it becomes available. You will use the same information as above. I will send an email reminder to you when the posttest becomes available.

If you would like to participate, please fill out the information below and return it to me. Then you are free to take the pretest. Please keep the first two pages for your records (it also contains your Subject ID#).

Print Name: _____

Email address: _____

APPENDIX C – FACULTY E-MAIL CONSENT

Hello Nicole,

I am most willing to allow students the opportunity to participate in your research. How long do you think you will need on each day (February 2 and February 9? I have three sections and they begin at 3:00 PM.
Please feel to contact me by cell phone at 704.718.3781. Thank you, Nicole. I look forward to meeting you.
Best,
Wanda P. Briggs

Dr. Wanda P. Briggs, LPC, NCC
Immediate Past-President, South Carolina Counseling Association
Associate Professor
Counseling and Development

RWR College of Education
Department of Counseling, Leadership and Educational Studies
Withers 145-B
Winthrop University
Rock Hill, SC 29733

briggsw@winthrop.edu
Office: 803.323.4722
Fax: 803.323.2585

From: Jordan, Jennifer [mailto:jordanje@winthrop.edu]
Sent: Tuesday, December 16, 2014 11:20 AM
To: CAVANAGH, NICOLE
Subject: RE: dissertation

Sure I would be interested in letting you do that.

From: CAVANAGH, NICOLE [mailto:NICKCAVA@mailbox.sc.edu]
Sent: Tuesday, December 16, 2014 10:57 AM
To: Jordan, Jennifer
Subject: dissertation

Good morning Dr. Jordan

My name is Nicole Cavanagh and I am a PhD student in the Counselor Education and Supervision program here at USC. I spoke with Briana from your office this morning regarding my dissertation and how I may contact you to see if you could help me with the intervention part of my dissertation. Dr. Moody Crews is on my committee- he and Angelica Yezzi Greiner both recommended Winthrop as a "dissertation friendly" community.

My dissertation is *Reflective Judgment: Can Problem-based learning approach make a difference?*. I am looking for Master's level counselor students to participate in a pretest/posttest intervention where I come to your classes and provide the students with an ill-structured problem and process the process of problem solving. This would require a minimum of 2 hours and a maximum of 3 hours of class/supervision time. I have over 12 years' experience teaching at the graduate level for social work students and am a licensed clinical supervisor for social workers (8 years).

If this sounds like something you would be willing for me to come to your classes and provide, I would love to talk to you about the details of approach. I would like to get started as soon into the semester as possible.

Thank you in advance for your time and consideration. You may also reach me on my cell phone at 803.348.2931

Nicole M. Cavanagh, Doctoral Candidate, LISW-CPs
BSW Field Coordinator/Clinical Instructor
College of Social Work
Hamilton Building Room 202 H
Columbia, SC 29208
(o) 803.777.0433 (f) 803.252.9303
nickcava@mailbox.sc.edu

APPENDIX D – PROBLEM-BASED LEARNING DILEMMA

Meet your client

"John is frustrated and sad everyday he comes to school, other students tease him.

Some call him names, while others talk about him and spread rumors.

One boy even pushes him and threatens to beat him up.

He's tired of coming to school and wants to drop out."

APPENDIX E – PROBLEM-BASED LEARNING PROCEDURE

Script and instructions for PBL: Adapted from Abdalla & Gaffar (2011) & Munshi (2012)

First Session: Duration- 1-2 hours

Good afternoon

Today we will be utilizing an alternative to traditional classroom learning called PBL. I will present you will a problem, not a lecture, assignment or exercises. You will not be handed the "content". Your learning becomes active in the sense that you discover and work with content that you determine to be necessary to solve the problem.

I will act as a facilitator and mentor, rather that a source of "solutions"

Problem-based learning will provide you with opportunities to:

- *Examine and try what you know*
- *Discover what you need to learn*
- *Develop your people skills for achieving higher performance in teams*
- *Improve your communication skills*
- *State and defend posititions with evidence and sound argument*
- *Become more flexible in processing information and meeting obligations*
- *Practice skills that you will need after you graduate*

Students are broken into small groups 8-10 (optimally) as guided by the researcher.

Introductions of researcher to the group

Facilitation of formal round of introductions of all participants

Step 1: EXPLORE THE ISSUES

- Introduce the ill-structured problem
- Discuss the statement and its significant parts
- *"You may feel that you don't know enoufht to solve the problem but that is the challenge! You will have to gather information and learn new concepts, principles, or skills as you engage in the problem-solving problem.*
- *Do you understand words, terms and notions?*

- *Do you agree on what they mean?"*

Step 2: LIST "What do we know?"

"What do you know to solve the problem? This includes bothwhat you actually know and what strengths and capabilities each team member has.Please consider and note everyone's input, no matter how strange it may appear: it could hold a possibility"

- *Note:* Brainstorming has four basic rules (Goff, 1998):
    - Criticism is ruled out
    - Freewhelling is welcomed
    - Quantity is desire
    - Combination and improvement are sought

Step 3: DEVELOP AND WRITE OUT THE PROBLEM STATEMENT IN YOUR OWN WORDS

"A problem statement should come from your/the groups's analysis of what you know and what you will need to know to solve it. You will need:

- *A written statement*
- *The agreement of your group on the statement*
  Note: the problem statement is often revisited and edited as new information is discovered, or "old" information is discarded"

Step 4: LIST OUT ALL POSSIBLE SOLUTIONS

- *List them all, then order them from strongest to weakest*
- *Choose the best one, or most likely to succeed.*

Step 5: LIST ACTIONS TO BE TAKEN WITH A TIMELINE

Ask yourselves:

- *What do we have to know and do to solve the problemJ?*
- *How do we rank these possibilities?*
- *How do these related to our list of solutions?*
- *Do we agree?*

HOMEWORK: Analyse/ investigate the case-

***"**Students will have one week to return with documentation of completionof steps 6 & 7"*

Step 6: LIST "What do we need to know?"

"*Research the knowledge and the data that will support your solutiosn. You will need informationt to fill in the gaps.*

- *Discuss possible resources (experts, books, websites)*
- *Assign and schedule research tasks, especially deadlines"*

Step 7: WRITE YOU SOLUTION WITH ITS SUPPORTING DOCUMENTATION, THE SUBMIT IT

" You will present your findings to the entire class. This should include:

- *The problem statement*
- *Questions and data gathered*
- *Analysis of the data*
- *Support or recommendations based on the data analyis: in short the process and outcome"*

Second Session: Duration 1-2 hours

Presenting and defending your conclusions:

The goal is to present now only your conclustiosn, but the foundation upon which they rest. Prepare to:

- *State clearnly both the problem and your conclusion*
- *Summarize the process you used, options considered, and difficulties encountered*
- *Convince not overpower. Bring others to your side, or considerwithout prejudice yoru supporting documentation and reason*
- *Help others learn as you have learned*
- *If challenged and you don't have an answer, present it clearly and you don't have an answer, acknowlege it and refer it for more consideration*

Sharing your finding with your classmates is an opportunity in demonstrating that you have learned. If you know your subject well, this will be evident. If a challenge arises that you cannot respond to, accept it as an opportunity to be explored. However, take pride in yoru attention to quality when you present

Review your performance

How do you feel?
How did the process go?
What have you learned?

APPENDIX F – RCI TEST

Demographic and Academic Information

I. **Student ID Number:**_____

II. **Birthdate:**_____
MM/DD/YY

III. **Are You (check one) _____Female**

_____Male

IV. **If you can recall, please provide:**

Your ACT composite score:_____

Your ACT composite percentile rank:_____

Your SAT Total score (Verbal + Quantitative)_____

Your SAT percentile rank:_____

V. **Racial/Ethnic Classification:**

___American Indian/Native American

___Asian

___Black

Hispanic/Latino/Latina

___White/Caucasian

___International Student

___Other: Specify:_____

VI. **Based on the number of current credit hours toward your degree, would you describe yourself as a:**

____Freshman

____Sophomore

____Junior

____Senior

____Beginning Graduate Student (having completed less than three years of graduate coursework)

____Advanced Graduate Student (having completed three or more years of graduate coursework)

Part II: Reasoning About Current Issues

Instructions: Because this questionnaire is aimed at understanding how people like you think about various current issues, it asks not only what you think but **why** you hold the opinions you do.

The Task: You will be shown five short descriptions of some current issues. These issues are similar because people sometimes disagree about the best answer. For each issue, you will be asked consider four general questions.

Question 1: In Question 1, you will be asked for your personal opinion about the issue. Please indicate it in the space provided.

Question 2: For some issues you will be asked:

Why experts disagree.

For other issues you will be asked:

Why you believe the way you do.

Take a moment to consider your opinion about the question. Write down your response to the question in a few sentences in the space provided. (**Do not**, for example, write down "I think experts disagree." or "I think that food additives are safe." **Instead** indicate in a few sentences **why** experts disagree or **why** you believe the way you do.

Please give the best answer **you** have to each question.

Question 3. You will be shown statements taken from interviews with people like yourself.

Please Indicate which statements are most similar to your own views by darkening the appropriate square.

Boxes **VS**, **S**, **D**, and **VD** are used to indicate whether your response is **V**ery **S**imilar, **S**imilar, **D**issimilar, or **V**ery **D**issimilar to your own thinking.

For example, if you read sentence A below and decided that it was **s**imilar to your views, you would darken the box labeled **S** as follows:

VS (S) D VD M A. Researchers who are honest will not disagree about whether a particular artificial sweetener is harmful.

It may be that your views on a topic do not exactly match the ones presented here. Please indicate a few statements for each issue which are at least somewhat similar.

A Check on Reading: Because we have found that some people do not read the statements carefully, we have included some statements that should **not** make sense to you. When you encounter such statements, mark them as "Meaningless" by darkening th (M).

Question 4. You will be asked to indicate your first, second, and third choices for which statements are like how you think.

Try to rank the top three statements for each issue, even if the statements do not exactly match your views. If only one or two statements are similar to your views, check the "none of these" box in the appropriate rankings.

Please mark only one statement per ranking.

APPENDIX G- RCI TEST SCENARIOS EXAMPLES

Preparing the Work Force for the 21st Century

Educators, civic leaders and members of the business community disagree about how to best prepare the work force of the 21st century. Some claim that colleges should emphasize basic subjects such as math, English, or history. If these courses are well-taught, they argue, students will have the general skills necessary for the future. Others argue that the rapid rate of change in the 21st century requires specific training in such skills that are adaptable to many situations, such as critical thinking or problem-solving. They argue that colleges should emphasize such general skills in order to better prepare people for learning after they leave college.

Causes of Alcoholism

Some researchers contend that alcoholism is due, at least in part, to genetic factors. They often refer to a number of family and twin studies to support this contention. Other researchers, however, do not think that alcoholism is in any way inherited. They claim that alcoholism is psychologically determined. They also claim that the reason that several members of the same family often suffer from alcoholism is due to the fact that they share common family experiences, socio-economic status, or employment.

Immigration Policy

Some economic experts claim that a less restrictive immigration policy adds to the overall economic prosperity of the United States. Admission of new immigrants, they argue, expands the tax base and economic competitiveness of American products and services. Other economic experts suggest that such policies result in a drain on the medical, financial and educational resources of the United States. These experts argue that a less restrictive immigration policy harms the economic well-being of the country.