2007

Epistemological congruency in community college classrooms: effects of epistemological beliefs on students experiences

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EPISTEMOLOGICAL CONGRUENCY IN COMMUNITY COLLEGE CLASSROOMS: EFFECTS OF EPISTEMOLOGICAL BELIEFS ON STUDENTS' EXPERIENCES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Educational Theory, Policy, and Practice

by
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May 2007

ACKNOWLEDGMENTS

My educational journey could not have come to a successful close without the help of numerous individuals. First and foremost, I am most grateful to my husband, Joel for his endless support and belief in my ability to achieve my goals. My two daughters, Shelby and Annie deserve a round of applause for their understanding about all the things I missed along the way. I hope one day our sacrifices inspire you both to value education and to realize your own dreams. My family's willingness to help under fire also enabled me to finish – thank you Mom, Dad, Kathy, Gene, Diane, Gene, Dane and Miles. Big "thanks" also to the Frugé clan: the late Dr. Bernard Frugé, Sr. and Mrs. Ann Frugé, Bernie, Cindy, John, Paula, Andre, Kelly, Bryan, Pat, and Michele. All of you helped me reach my goals in some way along this journey.

Numerous friends have also assisted me in some way at home or work or offered me encouragement or lunch breaks along the way: Camille Jarrell, Hilda Curry, Jodie Dupré, Monica Kiefner, Christine Barbier, Norrie Kenner, Lisa Moreno, Monica Salopek, Christine Starkovich, Carol Landry, Kim Warren, Tonya Shaw, Julie Walker, Lecta Bourgeois, Ann Smith, and Julie Mumme. Special thanks to Dr. Doris Chretien for her support over the years. A huge, enormous "thanks" to Sylvia Caillier Melancon for her tireless efforts to keep me afloat. You are truly one of the best friends I have ever had. I am grateful beyond words. Thanks to Dr. Patricia Cran for all her concern and care. Thanks to Priscilla Habetz for the much needed prayers and extra work at the pharmacy. There were also many sitters/friends who took wonderful care of my children: Gertie Theriot, Kristy Fontenot, Amanda Lopez, Claire Oliver, and Jeanne Stutes. Thanks also to Genevieve Rozas for her assistance.

I certainly could not have completed my educational requirements if not for the guidance and help of several faculty members. What an honor it has been to work with my major professor,

Dr. Becky Ropers-Huilman. I thank her for her patience, dedication, and support over these years. Her vast knowledge of higher education is amazing and inspiring. Dr. Susan Gardner, a truly dedicated professional, offered numerous hours of support and helpful information on qualitative research methods. Your words and time were always greatly appreciated.

When I began my master's program (too long ago), I was fortunate enough to work for and take classes with a wonderful educator and mentor, Dr. Gary Gintner. Additionally, during my tenure in my master's program, I was fortunate to meet another great counselor educator, Dr. David Spruill. I thank them both for believing in me then and now. Over the years, their advice and guidance have meant the world to me. My academic experiences with them gave me enough confidence to begin the doctoral program. Throughout the dissertation process, their comments helped me to broaden my thinking on personal epistemology, and they offered invaluable insight into my topic. Dr. Lilly Allen, my Dean's Representative, provided valuable input into the methodology for this dissertation. I am thankful for her comments, kind words of encouragement, and willingness to serve on my committee. I hope that one day I will positively impact students in the way each member of my committee has left a lasting impression with me.

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ABSTRACT

The purpose of this mixed method study was to explore epistemological beliefs of students as well as those of their instructors to determine how epistemological congruence or incongruence shapes students' experiences. The term, "epistemological congruency" is introduced to conceptualize the similarities or differences between students' and teachers' epistemological beliefs. Further, the study considers how students' grades, integration into the academic community, and intentions to persist are related to epistemological congruency between teacher and student. Students and faculty at a community college in the Southeastern United States participated in the study.

The theoretical framework for this study is based on Tinto's (1973, 1987, 1993) theory of student departure and Schommer's (1990, 1994) theory of epistemological beliefs. The Epistemic Beliefs Inventory (EBI) (Schraw, Dunkle & Bendixen, 1995; Schraw, Bendixen, & Dunkle, 2002), based on Schommer's (1990) theory of epistemological beliefs, was administered to the participants to determine where their beliefs lie on the five factors. Based on their responses, epistemological difference (ED) scores between student and teacher were determined. First, four students having the highest levels of congruence with the liberal arts instructor and four students with the lowest levels of congruence were chosen. Second, students chose other instructors they felt more or less "in sync" with in comparison to the liberal arts instructor.

All participating students and faculty completed the EBI and were interviewed to further expand on their epistemological beliefs. Students were interviewed on two occasions. These interviews centered on students' epistemological beliefs, interactions with their instructors, and facets of academic integration. Each student was presented as a case and based on cross case analysis, several themes emerged from data analysis. Some key themes emerged that indicated

epistemological congruence affected students' diverse experiences in the classroom: 1) students who were considered highly congruent with the liberal arts instructor faired better in the course, 2) a disconnect or miscommunication existed between teachers' intentions of teaching methods and students' perceptions of those intentions, and 3) likeability, personality characteristics and/or teaching styles influenced students' performance and intentions to persist. Implications for higher education and future research recommendations are discussed.

CHAPTER 1

INTRODUCTION

"Is this on the test?" This question is both common and daunting to many who teach in higher education. Even after engaging assignments and classroom exercises that emphasize critical thinking and multiple perspectives, often high-achieving students seem eager to ascertain the precise nature of their responsibility in terms of the content included in that session. "Will this be on the test?" becomes synonymous with the questions "What is valuable to know?" as well as, "How will I be expected to learn?"

Literature on epistemological theories addresses questions related to knowledge and learning. Students can be quite comfortable as passive learners, preferring lectures with concrete answers to engaged pedagogy (Baxter Magolda, 1992a; hooks, 1994; King, 2000). They can also, however, learn best when guided by a faculty member who focuses primarily on pertinent questions (Brookfield, 1995; Belenky, Clinchy, Goldberger & Tarule, 1986). Some students believe that learning must happen relatively easily, while others believe that learning needs to take place over time and using a variety of methods. Some view faculty members or as the final authorities on important knowledge, while others see knowledge as primarily connected and available for construction by all who are interested. At the same time, faculty members hold their own beliefs about how knowledge is acquired and constructed. Faculty attitudes and behaviors are key in shaping the educational environment, which in turn, can have dramatic effects on student learning and engagement (Umbach & Wawrzynski, 2005). Undoubtedly, the views of student and instructor cross paths in some significant ways in the classroom.

Challenges exist in the college classroom as faculty members attempt to facilitate the development of critical thinkers, life-long learners, and completers. When students enter the

higher education arena, institutions often state their goals for students' learning experiences; however, educators do not always consider or address students' current beliefs and theories about knowledge and learning, and how to refine or acquire new ones (Baxter Magolda, 2000; Ignelzi, 2000). For example, when preparing for class instruction or developing class assignments, instructors do not always consider what beliefs students hold about knowledge. It is important to be cognizant of students' ways of thinking about knowledge and learning, and faculty members' beliefs, and how these beliefs intersect to impact students' experiences (Hofer & Pintrich, 1997).

Epistemological Beliefs

Epistemology, as a branch of philosophy, refers to the origin, nature, limits, methods and justification of knowledge (Hofer, 2002a). According to Hofer (2004a), epistemological beliefs (Schommer, 1994), epistemological theories (Hofer & Pintrich, 1997), epistemic beliefs (Schraw, Bendixen, & Dunkle, 2002), and epistemological reflection (Baxter Magolda, 1992b) are diverse areas of investigation which "are part of a larger body of work categorized as 'personal epistemology'" (p. 1). Personal epistemology, according to Hofer (2004a), is "a field that examines what individuals believe about how knowing occurs, what counts as knowledge and where it resides, and how knowledge is constructed and evaluated" (p. 1). Further, the focus of the study of personal epistemology is "how the individual develops conceptions of knowledge or knowing and utilizes them in developing understanding of the world" (Hofer, 2002a, p. 4).

While individuals' beliefs about knowledge may be rather implicit, when they engage in any type of learning or are confronted with new information, these beliefs assist them in making decisions about what is valuable, credible, and important (Hofer, 2002a). We make meaning of new information with the assistance of our belief system. The adequacy of our epistemological beliefs will likely influence what and how we make meaning of new information (Hofer, 2002a).

Hofer (2002a) claims that while literature in the area of epistemology grew in the past two decades, results appeared in varying locations and the work is labeled under different constructs. Part of the reason for such diversity of the work is that scholars from many different fields display interest in this topic. Some of these fields include: educational psychology, developmental psychology, counseling, higher education, and science and math education (Hofer, 2002a). As a result, there are currently several models of personal epistemology with differing terminology and research paradigms.

Some of the earliest work on epistemological beliefs was a result of Perry's longitudinal study of male Harvard undergraduate students. Based on his longitudinal study, Perry (1968/1970) devised a developmental model reflecting how students' beliefs about knowledge change over time. The theory postulates that learners move through nine stages grouped into four major categories: Dualism, Multiplicity, Contextual Relativism, and Commitment and Relativism (Perry, 1968/1970). Perry suggest that students progress through these different positions.

The first position, Dualism, is characterized by students' beliefs that the "Right Answers exist *somewhere* for every problem, and authorities know them. Right Answers are to be memorized by hard work" (Perry, 1981, p. 79). The second position, Multiplicity consists of beliefs by students that knowledge is not absolute and that everyone is entitled to her or his own opinion. In the third position, Relativism, students consider context and evidence in forming their opinions. Perry's fourth position, Commitment, is concerned with students' choices and decisions made in the awareness of Relativism. The capacity to make choices and decisions lies within the individual. When students reach their final stages of development, Perry (1968/1970) suggests that students understand the implications, responsibilities, and ongoing characteristic of Commitment.

Perry's (1968/1970) development model is not without critics. Moore (2002) reports that in social constructivist literature some researchers include Perry's scheme in their critiques that developmental perspectives "emphasize individual cognition and universal forms of thought to the exclusion of sociocultural and contextual factors" (p. 25). Hofer and Pintrich (1997) state that the epistemological movement in the Perry's lower stages is clearer than movement in the upper stages. Schommer (1994a) proposes "that epistemological beliefs be conceived as a system of relatively independent beliefs" (p. 174). She claims that there is more than one epistemological dimension to consider and each dimension has a range of possible values. On the other hand, Schommer does not totally discount the role of development in personal epistemology. She also states that beliefs do not develop in synchrony and that the synchrony or asynchrony of beliefs is dependent on an individual's developmental level (Schommer-Aikens, 2002).

Schommer (1994a) outlines five epistemological dimensions and their corresponding values:

> (1) certainty of knowledge, ranging from knowledge is absolute to knowledge is tentative; (2) structure of knowledge, ranging from knowledge is organized as isolated bits and pieces to knowledge is organized as highly interwoven concepts; (3) source of knowledge, ranging from knowledge is handed down by authority to knowledge is derived through reason; (4) control of knowledge acquisition, ranging from the ability to learn is fixed at birth to the ability to learn can be changed; and (5) the speed of the knowledge acquisition, ranging from knowledge is acquired quickly or not-at-all to knowledge is acquired gradually. (p. 174-175)

According to Schommer (1994a) epistemological beliefs are relatively independent, meaning that individuals are not necessarily sophisticated or naïve in all beliefs concurrently. For instance, individuals may believe that the solution to poverty is highly complex, yet once the solution is found, it will be absolute (Schommer, 1994a). Rather than characterizing

epistemological beliefs as a single point on a dimension, Schommer proposes that individuals' epistemological beliefs are best represented as frequency distributions with the distinction between the naïve learner and the sophisticated learner a matter of the shape of the distribution. For example, the sophisticated learner may believe that a small amount of knowledge is unchanging, some knowledge has yet to be discovered, and a large amount of knowledge is evolving (Schommer, 1994b). On the contrary, the naïve individual believes much knowledge is certain, some knowledge has yet to be discovered, and a small portion of knowledge is changing (Schommer, 1994b).

While based on Perry's (1968/1970) groundbreaking work, the most noted distinction in Schommer's theory (1990, 1994) is that one cannot simply assume that epistemological beliefs are in sync, especially when individuals are changing their epistemological beliefs (Duell & Schommer-Aikens, 2001). In other words, beliefs are independent and may not develop at the same rate or be inconsistent with each other (Schommer & Walker, 1997). For example, an individual may hold extreme beliefs that knowledge is isolated, made up of pieces of information and certain or never changing. As development occurs, the individual's belief that knowledge is isolated may change to the belief that knowledge is highly complex and involves an intricate network of ideas. At the same time, this individual may still believe that knowledge is completely certain (Schommer & Walker, 1997).

Hofer and Pintrich (1997) relay the important contribution of Schommer's work in that her research initiated other researchers to investigate how epistemological beliefs might be linked to issues of academic classroom learning and performance. Schommer (1994a) purports that epistemological beliefs have indirect and direct effects on aspects of cognition and how students approach learning.

Epistemological Beliefs in the Classroom

In her Reflective Judgment Model, King (2000) describes the frustration and misunderstandings both student and teacher experience when there is a large discrepancy between student's and professor's expectations about a course and what should occur in the classroom. King further explains that both teachers and students hold expectations about the teaching and learning process and asserts that these expectations are shaped by prior experiences and personal philosophies. Some of these expectations reflect what both consider to be "important to learn, how it should be learned, who has what responsibilities in the teacher-student relationship," and how much time and energy should be devoted to the course (p.16). King (2000) asserts that a vital element underlying expectations about teaching and learning is the assumptions a person holds about knowledge and how it is gained.

These expectations and beliefs about teaching and learning are epistemological as they focus on the nature and origin of knowledge. Baxter Magolda (1992a) suggests that "students' epistemologies affect students' interpretations of community, involvement in learning, and the pedagogies aimed at creating both" (p. 267). In line with Baxter Magolda's assertions, Kember (2001) found that attitudes and the ability to cope with studying at institutions of higher education were influenced by students' sets of beliefs about knowledge and the process of teaching and learning. Kember suggests that higher education assist new students with the transition to belief systems in line with more experienced students.

Paulsen and Feldman (1999) explored the relationship between epistemological beliefs of students and their motivation to learn. They found that sophisticated beliefs in the areas of simple knowledge, quick learning, and fixed ability were significantly related to the motivational constructs of intrinsic goal orientation, extrinsic goal orientation, task value, control of learning,

self-efficacy, and test anxiety. Paulsen and Feldman (1999) and Kember (2001) discuss the need for higher education to provide a learning environment that promotes the development of students' epistemological beliefs.

Further evidence of the importance of and the need for additional research on students' epistemological beliefs is found in studies that assess students' beliefs and academic performance. Several researchers (Schommer 1988, 1990; Schommer, Crouse & Rhodes, 1992; Ryan, 1984) found that more sophisticated epistemological beliefs were related to better grades, enhanced test performance, and more sophisticated study strategies.

Dawn Schrader (2004) suggests that classrooms that feel intellectually safe to students, resulting in more conducive learning environments, are derived from a moral atmosphere and an epistemological "fit" between teacher and student. According to Schrader, a moral climate in the classroom is one where the instructor models respect, critical reflection, inclusiveness, and support. Schrader (2004) hypothesizes that even if a moral climate is present, there may be tension between students' and professors' epistemological perspectives or fit. The instructor may challenge students to think beyond their ways of knowing that feel comfortable, and the learning experience may not fit the students' epistemological perspectives. For instance, the teacher may validate contradictory viewpoints or focus on construction of knowledge rather than on disseminating knowledge (Shrader, 2004). On the other hand, students who feel supported in their views and safe to speak their mind and question their assumptions will more likely accept the challenge of a new way of thinking and be more apt to adopt new views. This event is described as "epistemic stretch" (Schrader, 2004). Further, students must first be met or valued at their initial level of epistemic thought before being able to accept new epistemologies.

Many studies in epistemological literature illustrate the importance of students' epistemological beliefs and their academic performance (Hofer & Pintrich, 1997; Kardash & Scholes, 1996; Kember, 2001; Paulsen & Feldman, 1999; Qian & Alvermann, 1995; Rukavina & Daneman, 1996; Ryan, 1984; Schommer, 1988, 1990, 1993a, 1993b; Schraw, Dunkle, & Bendixen, 1995). There is a paucity of research regarding students' beliefs in comparison to those of their instructors and how these beliefs affect students' experience and integration into the academic community. This paper introduced the term "epistemological congruency" to describe the congruency between students' and faculty members' epistemological beliefs.

Faculty-Student Interaction

An important part of in-class experiences is faculty-student interactions. This important role is especially true concerning learning and knowledge development. Tinto (1993) suggests that student and faculty interaction plays a major role in students' judgments of their intellectual congruence with others at the institution. Tinto (1993) states:

> The faculty, more than any other group, represents the primary intellectual orientations of the institutions. Their actions, within and without the classroom, provide the standards by which individuals come to judge the intellectual ethos of the institution. Issues of quality of intellectual work, commitment to student intellectual growth, and opportunities for student involvement in learning, especially in the classroom, are all deeply affected by the way the faculty interacts with students over matters of intellectual substance. (p. 53)

Several scholars have researched the importance of faculty-student interaction in shaping high-quality programs and learning experiences. For example, Haworth and Conrad (1997) emphasize the importance of faculty contact with students in their engagement theory of program quality. They assert that "high-quality programs are constructed around an interactive model of

communication in which faculty, students, administrators, and staff actively contribute to one another's learning" (Haworth & Conrad, p. 83). Further, Astin (1993) notes that student-faculty interaction has positive correlations with every self-reported area of intellectual and personal growth. Elements of the importance of faculty can also be seen in Chickering and Gamson's (1987) "Seven Principles for Good Practice in Undergraduate Education," as one of their principles for good practice stresses the importance of faculty and student contact.

Umbach and Wawryzynski (2005) explore the relationship between faculty practices and student engagement. According to their study, students reported higher levels of engagement and learning at institutions where faculty members emphasize active and collaborative learning techniques, interact with students, challenge students in the classroom, and emphasize higher level and critical thinking.

Teachers' Epistemological Beliefs

The literature is deficient in the area of college teachers' epistemological beliefs and their impact on students' experience (Hofer, 2001; Schraw & Olafson, 2002) despite evidence of the importance of faculty-student interactions. The available literature indicates teachers' epistemological beliefs are influential in the teaching and learning process (Beers & Bloomingdale, 1983; Scheurman, 1996).

Beers and Bloomingdale (1983) explored relationships between teachers' epistemological beliefs, course objectives, and views of student difficulties. They found teachers' attributions of student difficulties varied depending on the epistemological beliefs of the teachers. Scheurman's (1996) study examined instructors' epistemological beliefs and their assumptions about college students' reasoning. His findings indicate that professors tended to underestimate students' intellectual maturity and often "sell students short when it comes to perceptions of students'

dispositions toward critical thinking" (p. 14). What are the implications of the faculty member's assumptions on students' classroom experiences? It is likely that the learning environment will be affected in such a way that students will not be viewed as capable participants where instructors value and respect students' experiences (Baxter Magolda, 2000).

Hofer and Pintrich (1997) suggest that educators need to know more about the intersection of teachers' epistemological beliefs and those of students. As Tinto (1993) suggested, there is a critical, unexplored link between student classroom experiences and student departure. Perhaps, epistemological congruency is key in understanding the intersection of teachers' and students' beliefs while also providing insight into the impact of these beliefs on students' classroom experiences and their desires to persist.

Student Retention and Academic Integration

Student retention is a concern for colleges and universities nationwide. Research indicates that it costs more to recruit a student than it does to retain one (Astin, 1993; Beal & Noel, 1980). Competition for scant resources and calls for accountability also require colleges and universities to seriously consider their retention rates as a measure of institutional effectiveness. Some states and accrediting bodies use retention as a performance indicator for higher education (Burke & Serban, 1998; Ewell, 1998). The costs associated with student attrition impact not only the institutions of higher education but also the students and their families. Loss of revenue, lost opportunity, blocked access to certain careers, lowered self-esteem, and limits to standards of living are some of the problems related to student attrition in higher education (Congos & Schoeps, 1997).

According to the National Center for Education Statistics (NCES) (2003), after six years, only 51 percent of students beginning college in 1995-1996 obtained bachelor's degrees from the first

institution they attended. After two years, 16 percent left without earning their degree. NCES (2003) also reports that 41 percent of students who began in year 1995-1996, with an associate's degree goal, left higher education by 1998 without earning a degree. Because of the high costs of student attrition to all involved, much of the literature in higher education is dedicated to theories of student retention and persistence.

One of the most acclaimed theories of retention is Tinto's (1975, 1987, 1993) theory of student departure. According to Tinto (1993), colleges and universities are made of academic and social systems. Students' decisions to leave institutions of higher learning are impacted by the students' levels of integration into these academic and social systems. The academic system "concerns itself almost entirely with the formal education of students" (Tinto, 1993, p. 106). The social system focuses on students' more informal interactions with other students, faculty, and staff. Tinto (1993) states that the higher the level of integration the more likely the student will remain at the institution. His theory recognizes the importance of classroom and the student-teacher interaction that occurs therein. Tinto (1993) states "Student engagement is, for most institutions, centered in and around the classroom" (p. 132).

Dunwoody and Frank's (1995) review of the literature found that retention rates for individual classes have been ignored. It stands to reason that if students are not successful with individual course completion, they either are unlikely to be motivated to continue or will not be able to continue due to failing grades. They uncovered differences among students' and professors' ratings of importance of reasons for students' withdrawal from courses. Faculty members viewed non-course related student personal issues as more important reasons for withdrawal than did the students. Faculty viewed their own influences as less important than the students did. For example, "students marked 'I didn't like the professor' as the fourth most important reason

for withdrawal from a course" while instructors rated this reason as second to last in importance (Dunwoody & Frank, 1995, p. 555). This finding suggests that faculty members may not always be aware of their influences on student course persistence. The authors suggest that as the number of student withdrawals increase so does the overall cost of college. Many students are not financially able to continue, and federal financial aid requires students show satisfactory progress toward degree obtainment to continue to receive funding. Hagedorn, Maxwell, Chen, Cypers, and Moon (2002) assert that "course completion is the basic building block of student success" (p. 10).

Community College Learning Environments

Despite high attrition rates, students continue to enroll in institutions of higher education. Dennis (2004) projects higher education enrollment will experience an increase of 13 million students by the year 2012. Community college enrollments are likewise expected to increase. Demographers predict that in the next 10 years, the maturation of the Baby Boomers' children will bring a new influx of traditional college-age students to community colleges (Phillippe & Patton, 2000). In addition to the rise in numbers, community colleges are expected to enroll an increasingly diverse population of students (Phillippe & Patton, 2000).

Hirose-Wong (1999) claims that American community colleges, particularly urban ones, face unique challenges due to their diverse student body comprised of first generation, economically disadvantaged, non-White, under-prepared academically, non-traditional, and limited English ability students. In addition to demographic differences between community college and university students, community college students often have more diverse goals than their university counterparts.

Most community colleges maintain an open door admissions policy that provides the only portals to higher education for many students. For example, California adopted a Master Plan for Education which operates on a tiered system (Piland, 2004). The University of California System admits the top 12 percent of high school graduates. The California State University system enrolls the top 33 percent of high school graduates. High school graduates who do not meet these criteria and non-graduates past a certain age attend community colleges.

While the college offers open enrollment and access, it is equally important to consider what happens to students once they enter the doors of the institution. Research on retention in community colleges is sparse (Strauss & Volkwein, 2004; Wild & Ebbers, 2002). Wild and Ebbers (2002) suggest the importance of new retention research initiatives targeting community colleges. When applying Tinto's (1975, 1987, 1993) model to community colleges, many findings point to academic integration as having direct and indirect effects on persistence at community colleges (Napoli & Wortman, 1996, 1998; Nora, Attinasi & Matonak, 1990; Pascarella, Smart & Ethington, 1986). Other findings suggest that social integration had either no effect or a negative effect on persistence of commuter (Pascarella, Duby & Iverson, 1983; Fox, 1986) or community college students (Nora, Attinasi & Matonak, 1990). Sperling (2003) suggests that the diversity of the community college student body creates a complex environment. According to Sperling (2003), faculty who are committed to student success are often challenged in this environment to examine and question what theories and techniques about learners and learning will lead to more effective teaching practices.

In-class experiences are particularly important to community college students, since those students may not extensively engage in out-of-class activities (Chang, 2005; Tinto, 1993). It follows then that academic integration has more direct effects on persistence in community

colleges. Strauss and Volkwein (2004) found classroom experience is a more influential retention predictor at two-year institutions than at four-year institutions. Therefore, the community college, traditionally known for its teaching focus, may provide a rich context in which epistemological congruency, as one facet of integration, plays a particularly strong role in shaping students' experiences.

Statement of the Problem

Faculty-student interaction facilitates academic integration and thereby plays a significant role in the retention of community college students (Napoli & Wortman, 1996; Nora, Attinasi & Matonak, 1990). Experiences in the classroom are integral to students' academic integration and students' feelings of fitting in to the intellectual fabric of college life (Tinto, 1993). There is limited research on academic integration, retention and community college students (Strauss & Volkwein, 2004; Wild & Ebbers, 2002).

Mission statements of most colleges include terminology such as the "creation of lifelong learners" and "critical thinkers." Yet, in the classroom, instructors become perplexed when students fail to respond to assignments that require integration of ideas, fail to succeed with testing that requires thinking beyond rote memorization, or fail to grasp the concept that multiple theories can address the same complex problem resulting in no "right" solution (Schommer-Aikens, 2002). Instructors may wonder where their teaching went wrong or where students' thinking went awry.

The existing literature on personal epistemology offers insight into the relationship of students' beliefs and cognition, motivation, and learning outcomes. Yet, research studies that highlight the epistemological beliefs of college faculty and the impact of these beliefs on students' experiences are scarce (Hofer, 2001; Schraw & Olafson, 2002). This study adds to the

literature by exploring teachers' epistemological beliefs as well as those of their students. Although available studies provide valuable information, little is known about how students' and instructors' epistemological beliefs and the congruence or incongruence of these beliefs impacts students' experiences. Specifically, this study was guided by question: How does epistemological congruency relate to students' grades, academic integration and intentions to persist?

Purpose of the Study

The purpose of this study was to explore epistemological perspectives of students as well as those of their instructors to determine how epistemological congruence or incongruence shapes students' experiences. Further, the study considered how students' grades, integration into the academic community and intentions to persist were affected by these experiences. This study was designed to bring forth the perspectives of community college students and faculty, both of whom are understudied segments of higher education.

Research Questions

The main research question that guided this study was:

How does epistemological congruency affect students' experiences?

The research sub-questions are:

1. Is there a relationship between epistemological congruency and students' grades? If so, what is the nature of the relationship?
2. Is there a relationship between epistemological congruency and students' academic integration? If so, what is the nature of the relationship?
3. Is there a relationship between epistemological congruency and students' intentions to persist? If so, what is the nature of the relationship?

Significance of the Study

Several scholars indicate the need for further research in the area of students' and teachers' epistemological beliefs (Hofer, 2002; Kuhn & Weinstock, 2002; Schommer, 1994; Schommer-Aikens, 2004; Schraw & Olafson, 2002). Other researchers (Hofer & Pintrich, 1997; Qian & Alverman, 2000; Ryan, 1984; Schommer, 1988, 1990) underscore the importance of these beliefs and their linkage to aspects of cognition, motivation, and learning. My inquiry considered both students' and faculty members' beliefs and how the two may intersect (Hofer & Pintrich, 1997). The term "epistemological congruency" was introduced to characterize the congruency of students' and faculty members' epistemological beliefs. This study generated knowledge and paths for further inquiry about the impact of students' and faculty members' beliefs on students' higher education experiences.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this mixed method study was to explore how the congruency of students' and instructors' epistemological beliefs affects students' experiences, including students' grades, academic integration and intention to persist in college. To address these questions, literature in several fields was reviewed. First, theories of personal epistemology were reviewed, including the main approaches to studying personal epistemology. This area of the review also includes the evolution of the study of personal epistemology to give the reader a foundation of an area that invokes interest from numerous disciplines. Second, it is necessary to review research of students' epistemological beliefs and how these beliefs impact students' experiences from a variety of contexts. Third, since this study considers faculty members' epistemological beliefs and their affects on students' experiences, it must be established that student-faculty interaction matters; therefore, a portion of the review is dedicated to the relevance of the relationship between student and teacher. Fourth, a section is dedicated to research on teacher's epistemological beliefs. While research is somewhat deficient in this area (Hofer, 2002b; Schraw & Olafson, 2002), available literature suggests that teachers' beliefs shape students' classroom interactions and the need for further work in the area. Fifth, this review includes a discussion of the community college system to familiarize the reader with the advantages and challenges in this setting. The community college, traditionally known for its teaching-centered focus, will provide a rich context for the study. Last, a review of Tinto's (1993) theory of retention is included along with results of retention studies completed at community colleges to illustrate the importance of academic integration in this setting since the relationship between epistemological beliefs and retention is being considered.

Models of Personal Epistemology

According to Hofer (2004a), researchers who investigate personal epistemology are interested in an individual's beliefs and theories about knowledge and knowing. Jean Piaget's work is considered influential to personal epistemology (Hofer, 2004b; King & Kitchener, 1994: Schommer-Aikins, 2004) and experiential learning (Kolb, 1984). While work on learning styles and personal epistemology both consider individuals' experiences and how those experiences shape the learning process, work on learning styles takes into account how individuals' perceive and process information to create their own unique styles. Personal epistemology work considers how individuals' beliefs about knowledge might impact how they perceive and process and information. According to Kolb (1984) Piaget's contribution to experiential learning lies in Piaget's focus on the cognitive developmental aspect of intelligence and how it develops.

Kolb (1981) states that experiential learning emphasizes the importance of experience in the learning process. Further, in regard to the experiential learning model, he states that "The core of this model is a simple description of the learning cycle-of how experience is translated into concepts, which, in turn, are used as guides in the choice of new experiences" (p. 235). In experiential learning theory, learning is a four stage cycle which includes: Concrete Experience abilities (CE), Reflective Observation abilities (RO), Abstract Conceptualization abilities (AC), and Active Experimentation abilities (AE). Based on experiential learning theory, learning styles, according to Kolb (1981) are a result of "our hereditary equipment, our particular past life experience, and the demands of our present environment" (p. 237), and "most of us develop learning styles that emphasize some learning abilities over others" (p.237). Kolb (1984) states that people program themselves, based on their experiences, to emphasize at varying levels the four modes of the learning process which is in their unique learning style.

Scholars interested in epistemology also mention Jean Piaget as one of the predecessors of the study of personal epistemology (Hofer & Pintrich, 1997; King & Kitchener, 1994; Schommer-Aikins, 2004). Piaget (1966/1973), the genetic epistemologist, was interested in examining the formation of knowledge itself. The focus of genetic epistemology was to study the cognitive relations between the subject and the object (Piaget, 1966/1973).

Of theoretical importance to William Perry's groundbreaking longitudinal study of Harvard freshmen were some of Piaget's (1950) concepts of cognitive development (Perry, 1970). Perry's study was not originally intended to be a study of epistemology but rather an investigation of the ways students responded to the relativism which permeated a pluralistic university. Male students were interviewed throughout their undergraduate experience, and these interviews revealed trends in students' descriptions of their college experiences. His work resulted in his stages of ethical and intellectual development of college students reviewed in chapter one.

In their review of epistemological models, Hofer and Pintrich (1997) note that Perry's work was first to suggest that college students made meaning of their educational experiences through a developmental process and not a reflection of their personality characteristics. Hofer and Pintrich (1997) further note that the epistemological movement in the lower stages is clearer than movement in the upper stages. Belenky, Clinchy, Goldberger and Tarule (1986) criticize Perry's theory of intellectual and ethical development for the limitations in generalizing from their male sample of participants to a general college population. Subsequently, Belenky et al. (1986) attempted to replicate Perry's study with women participants.

The model of Belenky and colleagues (1986) provides "a set of epistemological perspectives from which women know and view the world" (p. 15). When their participants' responses did

not fit into Perry's scheme, Belenky et al. created their own classification system based on their study. Through their interviews with 135 women, they developed their own theory of the intellectual and epistemological development of women defined as "Women's Ways of Knowing." The following perspectives make up their theory: Silence, Received Knowledge, Subjective Knowledge, Procedural Knowledge, and Constructed Knowledge.

The first perspective, Silence, is where women feel disconnected from knowledge and are passive in their learning whereby they rely on authority figures for knowledge. Next, Received Knowledge, which can be likened to Perry's (1968/1970) Dualism, is characterized by either-or thinking (Belenky, et al., 1986). This perspective holds that there is only one right answer and ideas are thought of as good or bad, true or false while the origin of their knowledge is external. Belenky et al. (1986) describe the next perspective, Subjective Knowledge, as interchangeable with Perry's Multiplicity position. Subjective knowledge is also dualistic but the source of knowledge is within the self. In this phase, "women become their own authorities" (Belenky, et al., 1986, p. 54). In Procedural Knowledge, the following perspective, women applied objective and systematic measures to analyze information. The women were found to have two modes for using procedural knowledge: separate and connected knowing. The terms, Separate knowing and Connected Knowing were borrowed from Carol Gilligan (1982). Separate Knowing, in terms of Belenky et al.'s work, is considered to be the type of knowing used in traditional, undergraduate education. In contrast, connected knowing, while still accomplished through procedures of analysis, is personal and emphasizes understanding over judgment. Belenky et al. theorize that Constructed Knowledge, their last position, is an integration of subjective and connected knowing. "All knowledge is constructed and the knower is an intimate part of the known" and

context affects knowledge and truth (Belenky et al., 1986, p.137). In this position, knowers realize that they are responsible for the development of their knowledge.

While their work provided a much needed glimpse into how women interpret their educational experiences, Belenky and colleagues choice to utilize only women for their study resulted in criticisms of their conclusions. There has also been some criticism regarding credibility of results due to a reported lack of detailed information regarding methodology (Hofer & Pintrich, 1997). Baxter Magolda (1992b) found the models of Perry (1968/1970) and Belenky et al. (1986) to vary due to the populations from which they were developed. Baxter Magolda (1992b) set out to study both women's and men's epistemological development during college to explore further the possibility of gender differences.

Based on her five year longitudinal study, Baxter Magolda developed her Epistemological Reflection Model (1992b) which emphasizes the nature of learning in the college classroom. Results of her qualitative study identified four major ways knowing: Absolute, Transitional, Independent and Contextual. Absolute knowers viewed knowledge as certain and obtained from authority (instructors). Transitional knowers shared the epistemic assumption that knowledge was part certain and part uncertain. They acknowledged that authorities are not all knowing and began to recognize the uncertainty of knowledge. Independent knowers generated their own perspectives for the first time. They viewed knowledge as uncertain and held the view that everyone has his or her own beliefs; authority was not the only source of knowledge. It is at this stage of knowing that students start to believe in the value of their own opinions. Contextual knowers, which only made up 2 percent of senior interviews and 12 percent of fifth-year interviews, were capable of constructing their own opinions. They judge the soundness of their ideas or knowledge claims based on supporting evidence; yet; they situate their knowledge based

on context and do not automatically transfer ideas to new situations without evaluating. Based on her findings, Baxter Magolda (1992b) states that gender-related patterns emerged in three of the four different ways of knowing. She describes them as gender-related patterns since patterns did not appear to be dictated by gender but rather there were particular patterns used more often by a particular gender. On the other hand, in the last way of knowing, contextual knowing, the gender-related patterns of the earlier perspectives converged. Baxter Magolda's sample consisted of mostly white, middle class college students at one mid-size Midwestern university. Hofer and Pintrich (1997) suggest that comparative work in other populations is needed and that there are limitations of the scope of Baxter Magolda's study due to the definition of epistemology that was used since it was largely based on student perceptions of learning experiences.

According to Baxter Magolda (2004), the term epistemological reflection refers to the assumptions about the nature, limits, and certainty of knowledge, and how those epistemological assumptions evolve during adulthood. Therefore, her model is considered developmental in nature. King and Kitchener's Reflective Judgment Model (1994) is also considered developmental (Hofer, 2004b). Their model outlines a developmental progression in the way individuals understand the process of knowing and in the corresponding ways that they justify their beliefs about ill-structured problems, which they define as problems with no clear, distinct answer (King & Kitchener, 1994). The authors' work focuses on ill-structured problems because of their belief that solving ill-structured problems relies on the use of epistemic cognition. This term is defined as "the process an individual invokes to monitor the epistemic nature of problems and the truth of alternative solutions" (King & Kitchener, 1983, p. 225). In addition, they also contend that "true reflective thinking is uncalled for unless real uncertainty exists about the

possible solution(s) to a problem" (King & Kitchener, 1994, p. 13). King and Kitchener's work is based on Perry's (1968/1970) scheme and the reflective thinking work of John Dewey (1933).

King and Kitchener's (1994) developmental model consists of seven stages that focus on "the ways that people understand the process of knowing and corresponding ways they justify their beliefs about ill-structured problems" (p. 13). The seven stages comprise three levels: Pre-reflective Level, (stages 1, 2 and 3), Quasi-Reflective (stages 4 and 5) and the Reflective (stages 6 and 7). Pre-Reflective thinking is characterized by the assumptions that knowledge is simple, absolute and derived directly from experience. These individuals do not differentiate between well- and ill-defined problems. Unlike the Pre-Reflective stage, individuals at the Quasi-Reflective stage recognize that knowledge is uncertain, contextual and subjective. Reasoning in the Quasi-Reflective stage "recognizes that knowledge claims about ill-structured problems contain elements of uncertainty; thus there is an understanding that some situations are truly problematic" (King & Kitchener, 1994, p. 16). The problem arises for these individuals when they try to make judgments while also considering the uncertainties. The most advanced sets of assumptions occur in the Reflective Stage. Individuals at this stage begin to understand that one's understanding of the world is constructed and not given to them. In addition, this stage is characterized by an individual's belief that knowledge is contextual and that it "must be understood in relation to the context in which it was generated" (King & Kitchener, 1994, p. 17). Individuals at this stage also realize that while one cannot obtain absolute truth, some views are more reasonable than others (King & Kitchener, 1994).

King and Kitchener (1994) developed their model based on their longitudinal study of participants from high school students to middle aged adults. The authors state that reflective judgment and the ability to judge knowledge claims is the ultimate goal of epistemological

development (King & Kitchener, 1994). Results of their study indicate that only a small fraction of individuals attained Reflective Judgment and those individuals were usually advanced graduate students. Hofer and Pintrich (1997) suggest that King and Kitchener's model provides the most extensive developmental scheme with epistemological elements. Yet, they also outlined limitations of the model which include: (1) ill-structured problems may not capture students' ideas about knowledge and knowing that are activated in every day educational settings and (2) issues related to transferability of results to non-White populations (Hofer & Pintrich, 1997).

Like King and Kitchener (1996), Deanna Kuhn (1991) was also interested in how individuals responded to ill-structured problems. Her study consisted of individuals from four age groups, ranging from teens to people in their 60s. The primary objective of the study was to examine informal reasoning about real, complex problems of every day life with a focus on argumentative thinking. According to Kuhn (1991), argumentative thinking involves thinking that is in the form of an argument. Specifically, Kuhn was interested in exploring the processes of thinking and reasoning that lead people to hold the views that they do.

Kuhn (1991) offers three categories of epistemological views: Absolutist, Multiplist, and Evaluative. Absolutists stress facts and expertise as a basis for knowing. They view knowledge as absolute and certain and believe that experts can or do know the causes of phenomenon in question; whereas, the Multiplists are more skeptical about expertise and who is considered as an expert. They sometimes feel that they have as much knowledge as the experts. Individuals at this level accept the coexistence of multiple viewpoints but have difficulty reconciling divergent viewpoints. In contrast, Evaluative thinkers recognize that they may not have as much knowledge as experts but retain the belief in the uncertainty of knowledge. They are also able to

compare and evaluate viewpoints while considering adequacy and merit. Hofer and Pintrich (1997) recognize Kuhn's work as valuable due to the connection of epistemological theories to argumentative reasoning and how individuals respond to "everyday, ill structured problems that lack definitive solutions" (p. 103). On the other hand, they note Kuhn's work is less clear "in the definition of elements that comprise epistemological theories" (p. 105). Hofer and Pintrich note "the interview protocol is described as addressing issues of proof, expertise, and certainty" (p. 105), yet "the assignment of responses to levels…was based solely on questions relating to expertise, although responses regarding both certainty and proof are provided as illustrations of the three levels" (p.105).

As Hofer (2004a) notes, there are two dominant approaches to studying personal epistemology. One approach, as evidenced by the aforementioned models, operationalizes the construct of personal epistemology as a cognitive developmental process that proceeds in a patterned, developmental sequence. Duell and Schommer-Aikins (2001) consider these theories unidimensional in that if one dimension develops the other dimensions also develop. A second approach is Schommer's theory (1990, 1994a) which conceptualizes personal epistemology as a system of relatively independent beliefs about knowledge and learning (Hofer 2004b). Personal epistemology, then, consists of multiple beliefs. In her theory, there is more than one epistemological dimension to consider and each dimension has a range of possible values. In addition, if one dimension develops, the others may or may not develop. Within this conceptualization, On the other hand, Schommer-Aikins (2002) does not totally discount the role of development in personal epistemology. Yet, she asserts that beliefs do not develop in synchrony and that the synchrony or asynchrony of beliefs is dependent on an individual's developmental level.

Schommer (1990) hypothesizes five epistemological beliefs stated from a naïve epistemological persuasion:

> (a) Knowledge is simple rather than complex (simple knowledge); (b) Knowledge is handed down by authority rather than derived from reason (omniscient authority); (c) Knowledge is certain rather than tentative' (certain knowledge); (d) The ability to learn is innate rather than acquired (innate ability); and (e) Learning is quick or not all (quick learning). (p. 499)

To assess her theory of an epistemological belief system, Schommer constructed a questionnaire, the Schommer Epistemological Questionnaire (SEQ) to assess the five hypothesized beliefs. Factor analysis generated four factors, with the exception of the source of knowledge (stated in the naïve perspective as omniscient authority), that accounted for 55.2 percent of the variance**.** Subsequent factor analysis replicated the same four factors (Schommer, 1993; Schommer et al., 1993). Hofer and Pintrich (1997) suggest that this dimension (source of knowledge) may be more multidimensional and complex and this complexity may not be addressed by the inventory items.

In later research, Schommer (1994a) discusses her theoretical delineation of the facets of epistemology. She outlined five dimensions and their corresponding values:

> (1) certainty of knowledge, ranging from knowledge is absolute to knowledge is tentative; (2) structure of knowledge, ranging from knowledge is organized as isolated bits and pieces to knowledge is organized as highly interwoven concepts; (3) source of knowledge, ranging from knowledge is handed down by authority to knowledge is derived through reason; (4) control of knowledge acquisition, ranging from the ability to learn is fixed at birth to the ability to learn can be changed; and (5) the speed of the knowledge acquisition, ranging from knowledge is acquired quickly or not-at-all to knowledge is acquired gradually. (pp. 174-175)

Schommer-Aikins (2004) listed six features of her proposed system that distinguish it from previous work in the area. They are as follows: "(1) the addition of beliefs about learning, (2) the identification of distinct beliefs, (3) the consideration of asynchronous development, (4) the acknowledgment of need for balance, (5) the introduction of belief nomenclature, and (6) the introduction of quantitative assessment" (p. 20). According to Schommer-Aikins (2004) her multidimensional theory grew out of the synthesis of the prior personal epistemology research, specifically the work of Perry (1968), Kitchener and King (1989), Ryan (1984), Schoenfeld (1983, 1985) and Dweck and Legget (1988).

Schommer-Aikins (2004) states that her ideas of separate beliefs and beliefs about learning were a result of Schoenfeld's (1983, 1985) and Perry's (1968) work. Schoenfeld (1983,1985) completed interviews and observations on students solving geometry problems aloud. Schoenfeld (1983) reports that students' belief systems shape their behavior as they solve problems. He refers to this belief system about mathematics as an individual's "mathematical world view" which consists of a "set of (not necessarily conscious) determinants of an individual's behavior" (Schoenfeld, 1985, p. 15). He asserts that beliefs about self, the environment, the topic and mathematics influence the individual's world view. For example, in his study (1983), students' beliefs in their own failures resulted in the students never seriously trying to solve the problem. A second finding included students who believed that mathematical knowledge must be remembered were perplexed stumped when a certain procedure was forgotten. On the other hand, the student who believes that a procedure can be derived acted differently and tried to solve the problem. In addition, Schoenfeld (1985) notes that when students worked problems with instructions established by the teacher, they were capable of solving the problems. When the type of problems changed, and students were required to

discover information in a real life situation, they did not think to invoke the knowledge they were capable of using with the other teacher prescribed problems (Schoenfeld, 1985). Schommer-Aikins (2004) states that her epistemological dimensions of (1) ability to learn; (2) speed of learning, and (3) source of knowledge were derived from Schoenfeld's (1983, 1985) work.

Schommer-Aikins (2004) reports that "the beliefs about the structure of knowledge, the source of knowledge, and the stability of knowledge were well-established points of interest based on the works of investigators such as Perry and King and Kitchener" (p. 20). According to Schommer-Aikins (2004), the influence of Dweck and Leggett (1988) came in the form of more support for the idea that a belief in the ability to learn is critical to the learning process. Dweck and Leggett's (1988) social-cognitive model suggests that adaptive and maladaptive behavior (mastery-oriented and the helpless patterns, respectively) can be accounted for by individuals' implicit theories. In addition, these implicit theories orient people towards different goals which in turn set up different patterns of behavior. For example, children who held the belief that intelligence was a fixed or uncontrollable trait, were more likely to pursue the performance goal of securing positive judgments of or preventing negative judgments of their intelligence. In addition, these children were also more likely to display helpless behavior when they faced difficult tasks or a failure. Dweck and Leggett (1988) consider performance goals to be maladaptive in that individuals are not focused on increasing their ability but rather on gaining favorable judgments.

It was Ryan's (1984) work on metacognition that led to Schommer's development of a questionnaire to assess the five hypothesized beliefs. Ryan (1984) used a quantitative measure to statistically link personal epistemology and an aspect of learning. His study revealed that the more students believed knowledge was dualistic, the more they believed they understood

material based on only memorizing facts. Relativist thinkers, on the other hand, assumed understanding if they saw connections among ideas and were able to apply what they learned.

The most noted distinction in Schommer's theory is that one cannot simply assume that epistemological beliefs are in sync, especially when individuals are changing their epistemological beliefs (Duell & Schommer-Aikins, 2001). In other words, beliefs are independent and may not develop at the same rate or be consistent with each other (Schommer & Walker, 1997). For example, an individual may hold extreme beliefs that knowledge is isolated, made up of pieces of information and certain or never changing. As development occurs, the individual's belief that knowledge is isolated may change to the belief that knowledge is highly complex and involves an intricate network of ideas. At the same time, this individual may still believe that knowledge is completely certain. Schommer-Aikins (2004) clarified that to develop or to be more mature means that the belief supports higher order thinking.

Schommer-Aikins (2004) notes that in introducing a system of epistemological beliefs, she also "introduced the notion of *belief* into this field of study" (p. 21). According to Schommer-Aikins (2004), references to personal epistemology have included a variety of terms over the years such as epistemic positions (Perry, 1968), epistemic cognition (King & Kitchener, 1994), and epistemological reflection (Baxter Magolda, 1998). Her reasoning for the *belief* introduction was that personal epistemology seemed to have many characteristics that are attributed to beliefs in general. Both constructs possess the following characteristics: resistant to change even when confronted with contradictory evidence, powerful influences on thinking, and not always based on logic or knowledge. Schommer-Aikins (2004) noted that the use of the term *belief* allows researchers to tease apart aspects of previous thick descriptions, which in turn provides for a more analytical inspection of individuals' epistemological beliefs.

Hofer and Pintrich (1997) articulate several contributions of Schommer's (1990, 1994a) line of research. First, she suggested the possibility that epistemological beliefs may be a system of dimensions that are relatively independent of one another. Second, they noted that she initiated an empirical investigation of the study of several dimensions of epistemological thought. Third, her research initiated a line of research that links epistemological beliefs to issues of academic classroom learning and performance.

While Hofer and Pintrich (1997) noted contributions of Schommer's theory (1990, 1994a), they also discuss their views regarding shortcomings of her theory. First, they assert that the concepts of fixed ability and quick learning lie outside the construct of epistemological beliefs. They suggest that fixed ability does not follow the patterns of other dimensions and is not useful as predictor in Schommer's research. In addition, they purport that quick learning is a perception of the difficulty of a learning task and a goal regarding learning. The authors further their argument by suggesting that "Although beliefs about learning are probably related to beliefs about knowledge, they can be distinguished conceptually" (Hofer & Pintrich, 1997, p. 109). Their review notes that although beliefs about the nature of knowledge and the nature of intelligence or ability may be correlated with one another, they are separate constructs. Similarly, even though beliefs about whether learning is quick predict comprehension and performance, it does not mean that it is an epistemological belief (Hofer & Pintrich, 1997). Hofer and Pintrich's second critique is that Schommer's fifth dimension, source of knowledge, lacks empirical validation as a factor in her studies. They suggest that the belief labeled "source of knowledge" may be more complex and multidimensional than Schommer's conceptualization.

Hofer (2004b) notes that one of the most important implications of the paradigmatic distinctions in Schommer's approach and the developmental approaches is the relationship

between personal epistemology and education. Those who view personal epistemology as developmental in nature usually explore how educational experiences enhance individuals' progression to more advanced epistemological levels. On the other hand, those who consider epistemological beliefs as a unique characteristic of the individual, a trait-like aspect of individual differences, are usually interested in how these beliefs influence learning (Hofer, 2004b). As a result, "beliefs are viewed as predictors of outcome variables such as achievement, comprehension, and conceptual change" (Hofer, 2004b, p. 46). Since this study sought to explore the relationship between the outcome variables of persistence, grades and academic integration, this study was framed using Schommer's (1990, 1994a) model of epistemological beliefs. Research on epistemological beliefs in classroom settings follows.

Epistemological Beliefs in the Classroom

Students enter the college classroom with their "epistemological baggage" which may help or hinder their learning or affect their feelings of congruence with the institution (Schommer, 1993b, p. 368). It is likely that students and faculty are not aware of the profound influence students' beliefs have on their experiences in higher education since epistemological beliefs of either teachers or students are rarely discussed in the classroom. Schommer-Aikins (2004) suggests that "these beliefs are likely to influence how students learn, how teachers instruct, and subsequently, how teachers knowingly or unknowingly modify students' epistemological beliefs" (p. 27). Baxter Magolda (1992a) proposes that "students' epistemologies affect students' interpretations of community, involvement in learning, and the pedagogies aimed at creating both" (p. 267).

In line with Baxter Magolda's assertions, Kember (2001) finds that attitudes and the ability to cope with attending institutions of higher education in Hong Kong were influenced by students'

sets of beliefs about knowledge and the process of teaching and learning. Based on interviews, participants were categorized into one of two belief sets which consisted of two broad orientations: Didactic/Reproductive or Facilitative/Transformative. New students with didactic/reproductive beliefs found it difficult to adjust to higher education if the teaching was not expository. They also had difficulty with assignments that required higher level thinking that did not involve memorization or simple reproduction of material because these types of assignments were incompatible with their didactic/reproductive epistemological beliefs. Kember suggests that higher education assist new students with the transition to belief systems in line with more experienced students.

Paulsen and Feldman (1999) explore the relationship between students'epistemological beliefs and their motivation to learn. Utilizing Schommer's (1990, 1994a) multidimensional framework of epistemological beliefs, they found significant relationships between the three dimensions of epistemological beliefs to include simple knowledge, quick learning and fixed ability and the motivational constructs of intrinsic goal orientation, extrinsic goal orientation, task value, control of learning, self-efficacy and test anxiety. Students with more mature or sophisticated beliefs regarding the complexity of knowledge, were more likely to have higher scores on their intrinsic motivation score. Students with the naïve belief that the ability to learn is fixed were less likely to have an intrinsic goal orientation, to appreciate the value of learning tasks, to perceive an internal control over learning, and to feel efficacious about their capacity to learn than were students with the more sophisticated belief that the ability to learn can be improved over time. In addition, students with a naïve belief in quick learning were also more likely than other students to have an extrinsic goal orientation toward learning.

In a study of secondary students, Schommer and Walker (1997) found a relationship between high school students' epistemological beliefs and attitudes toward school. They presented a scenario to students about a hypothetical character. The students were instructed to give advice to this student about whether or not he should attend college even though his grades were poor and his parents had no money. Students were also asked about their feelings about school and their expectations for the demands of college. Attitudes towards school were regressed on their epistemological belief factor scores. Results indicated that the more students disagreed with fixed ability or the more they believed that the ability to learn can be improved over time, the more likely they were to indicate that they valued education, that persistence in the face of academic adversity is critical, and that tenacity in studying is expected (Schommer & Walker, 1997). Like Kember (2001), Paulsen and Feldman (1999) discuss the need of higher education to help advance students from naïve beliefs to more sophisticated beliefs held by more experienced students. The findings of Schommer and Walker (1997) denote the influential effect of students' epistemological beliefs on their attitudes regarding higher education. There is also evidence that students with more naïve beliefs do not perform as well in higher education settings.

In two studies, Schommer (1988, 1990) found that the more students believed in certain knowledge, the more likely they were to write inappropriately absolute conclusions. In addition, her 1990 study found that the more students believed in quick learning, the more likely they were to write weak conclusions, perform poorly on a mastery test, and express over-confidence in their understanding of the text material. Schommer (1990) outlines her theory of five dimensions regarding the nature of knowledge: "the structure, certainty, and source of knowledge, and the control and speed of knowledge acquisition" (p. 498). In a later study,

Schommer, Crouse and Rhodes (1992) explored the relationship between epistemological beliefs and mathematical text comprehension. Participants in this study read text from a statistics book. Measures of their level of mastery of the information, prior knowledge, and use of study strategies were administered. In addition, students' confidence in their understanding was measured and used as a measure of metacognition. Regression analyses, controlling for prior knowledge and gender, revealed the less the students believed in simple knowledge, the better they performed on the mastery test and the more accurate their assessments of their own understanding. In addition, the less students believed in simple knowledge, the more sophisticated were their study strategies. More sophisticated study strategies resulted in better grades. These relationships were significant when controlling for age and grade point average as well.

Schraw, Dunkle and Bendixen (1995) investigated the relationship between two kinds of problem solving using Kitchener's (1983) model of hierarchical cognitive processing and the relationship between epistemic beliefs and ill-defined problem solving. They wanted to determine whether well-defined problem solving requires different cognitive processes than ill-defined problem solving and if epistemic reasoning can be linked to Schommer's (1990) five dimensions of epistemological beliefs. The authors constructed the Epistemic Beliefs Inventory, based on Schommer's EQ (1990), for their study and found it to be a reliable and valid measure (Schraw et al., 1995). They also identified a distinct omniscient authority factor, which had not been done with Schommer's EQ. Other conclusions included: (1) performance on well-defined task was independent of performance on the ill-defined task, (2) epistemic beliefs explained a theoretically significant proportion of variation in ill-defined problems and (3) epistemic beliefs

failed to explain a meaningful proportion of variation in well-defined problem solving (Schraw, et al., 1995).

The authors concluded that the reason that epistemic beliefs explain a significant proportion of the variation in ill-defined problems and not well-defined problems is because as Kitchener's (1983) three level model suggested, epistemic assumptions affect higher-level problem solving but are independent of lower-level problem solving. According to Kitchener, lower level problem solving is an automatic process that works independently from one's personal beliefs. At higher levels, individuals accept more ambiguity and contradictions; therefore, epistemic assumptions require more sophisticated criteria to assess and analyze a problem (Schraw et al., 1995). Schraw et al. further noted that their findings were also consistent with Schommer's (1990) findings that certain knowledge was related to ill-defined problem solving over and above the effects of age and education.

Other studies of epistemological beliefs considered how students integrate and acquire new knowledge (Buell & Alexander, 2001). Qian and Alvermann (1995) used an adapted Schommer's Epistemological Questionnaire (1990) and found that beliefs about simple-certain knowledge and quick learning are important factors in conceptual change learning. Conceptual change learning involves a restructuring or shift resulting in changes in an individual's existing idea, belief, or way of thinking (Davis, 2001). They found that students who have immature beliefs about learning and knowledge and who have learned to be helpless are less likely to relinquish their naïve theories in conceptual change learning.

Kardash and Scholes (1996) examined the influence of undergraduates' beliefs about the certainty of knowledge, the strength of their beliefs about a controversial issue and their tendency to enjoy effortful thinking on their interpretation of controversial information. Their

participants completed the SEQ and reported the degree to which they believed HIV causes AIDS. Next, they read a passage that offered two conflicting views about the nature of the relationship between HIV and AIDS. Last, they wrote a paragraph to conclude the two view points. Regression analyses revealed that the less students believed in certain knowledge, the less extreme their initial beliefs about the relationship, and the more they liked engaging in cognitively challenging tasks, the more likely were their concluding paragraphs reflective of the inconclusive, tentative nature of the divergent views they had read. On the other hand, people with strong beliefs in the certainty of knowledge, extreme initial convictions and a self-reported reluctance to participate in cognitively challenging tasks were more likely to ignore totally the inconclusive nature of the information they read. Kardash and Scholes (1996) reported that their work extended Schommer's (1990) research in that they replicated her factor structure and the relative independence of the factors. They also contend that their study supports Schommer's (1990) assertions that epistemological beliefs affect the critical interpretation of knowledge. The authors contend that their research, as well as that of Schommer, provides support for the notion that people's general beliefs about the certainty of knowledge can cause them to distort highly tentative and highly contradictory information to conform to their beliefs.

In a similar study, Rukavina and Daneman (1996) examined the roles of students' beliefs about the structure of knowledge and their ability to integrate and comprehend competing scientific claims. Students, including high school and undergraduate students, completed items from Schommer's EQ (1990) that dealt with the complexity or simplicity of knowledge and items that addressed whether or not knowledge is a series of separate bits of information or integrated ideas. They also completed measures designed to assess their acquisition of scientific knowledge and working memory span. Statistical analysis revealed that students with mature

beliefs about the complexity of knowledge and integration of knowledge demonstrated greater knowledge acquisition overall than students with immature beliefs.

Also interested in comprehension strategies, Ryan (1984) found that different comprehension standards are associated with different epistemological orientations and with different levels of academic performance. An instrument based on Perry's (1968/1970) epistemological positions was administered to classify students as predominantly dualistic or relativistic in their thinking. Dualistic thinkers were fact oriented and had few comprehension strategies. On the other hand, relativistic thinkers used more applied strategies. Relativistic thinkers earned better grades than their dualistic counterparts. Based on his findings, Ryan (1984) concludes that epistemological beliefs can be significant predictors of course grades even after controlling for academic aptitude and amount of college experience.

Schommer (1993a) investigates the development of secondary students' epistemological beliefs and the influence of the beliefs on academic performance. Her findings indicate that beliefs in simple knowledge, certain knowledge, and quick learning lessened significantly from freshman to senior year. It should be noted that this study was cross-sectional, and a recommendation for a longitudinal design was mentioned. Schommer finds that the belief in quick learning predicted academic performance even after considering general intelligence; the less students believed in quick learning the higher the GPA. She suggested that students who believe in quick learning likely choose study strategies related to memorizing lists of facts. When students memorize these facts, they feel as though they understand the material. The beliefs affect study strategy selection and students' standards for comprehension. These standards and strategies ultimately affect academic performance. Hence, Schommer lent further support for the hypothesis that epistemological beliefs can have indirect effects on performance.

Schommer, Calvert, Gariglietti, and Bajaj (1997) completed a longitudinal study which was a continuation of Schommer's (1993a) study. They found that students' beliefs in fixed ability to learn, simple knowledge, quick learning, and certain knowledge changed as they neared the end of their fourth year of high school. Similar to Schommer's (1993a) study, the less students believed in quick learning, the better their GPA.

Schommer (1993b) also studied epistemological differences between junior college students and university students. She completed a study to assess college students' epistemological beliefs and made comparisons between junior college and university students and between technological science majors and social science majors. Her study revealed that junior college students were more likely to believe in simple and certain knowledge and quick learning. Students at four year institutions were more likely to believe in innate ability. Without student characteristics in the equation, technological science majors (physics) were more likely to believe in quick learning. When gender entered the equation, the difference was eliminated due to gender differences. Specifically, men were more likely to believe in quick learning. Younger students and educational psychology majors were likely to believe in simple knowledge. Findings also indicated that background variables such as age, gender and parental education contributed to differences between groups. Differences between groups in beliefs about simple knowledge were eliminated when parental education entered the equation. "The more education parents had and the more encouragement they gave for independent decision making, the less likely students were to believe in simple knowledge" (Schommer, 1993b, 362). Differences between groups in beliefs about quick learning were also eliminated when parental education and gender entered the equation. "The more education parents had, the farther along in school students were, the less likely students were to believe in quick all-or-none thinking" (Schommer,

1993b, p.364). Differences between university and junior college students' beliefs in innate ability and certain knowledge were still significant with the addition of these variables. Schommer (1993b) claims that students at both institutions come to higher education with a wide range of invisible barriers to higher-level thinking and she suggests that a beginning remedy to this problem is to make epistemological beliefs an explicit issue on campus.

While most of the above studies focused on epistemological beliefs in relation to learning outcomes or academic performance**,** some studies examined various classroom experiences and how they influenced students' epistemological beliefs. For example, Jehng, Johnson and Anderson (1993) completed a study with undergraduate and graduate students to determine whether or not an individual's educational level and field of study influenced epistemological beliefs. Students completed an epistemological beliefs scale based on Schommer's (1990) five factor theory of epistemological beliefs. Based on their findings, they concluded: (1) epistemological beliefs are multidimensional, (2) beliefs about learning may evolve as one is exposed to more advanced education, and (3) individual epistemological beliefs depend upon a student's academic field. The authors reported that their work confirmed Schommer's (1990) five factor theory. In addition, they hypothesized that instructional environments may be the crucial factor that accounts for the differences in students' epistemological beliefs at the undergraduate and graduate levels. Their examples included how undergraduate instruction focuses on general knowledge, and assignments are well-structured with clear solutions. At the graduate level, content is less structured, contradictory viewpoints are presented and instructional methods change (Jehng et al., 1993). Graduate students relied more on their independent reasoning, acknowledged the uncertainty of knowledge and the lack of orderliness of the learning process. Students in soft fields (social sciences, arts and humanities) were more likely than

students in hard fields to believe that knowledge is uncertain and depends on independent reasoning.

Denise Tolhurst (2004) completed a study to investigate the effects of a major course revision on students' epistemological beliefs. Instructors felt that students were too passive in an information systems course and were not taking responsibility for their learning. Their opinions were based on students' lack of attendance in lectures and requests for detailed information on assignments and recommended sources of information from instructors (Tolhurst, 2004). Restructuring of the course included reducing the number of lectures and introducing independent activities and small workshops. Students' epistemological beliefs were surveyed at the beginning of the course and again twelve weeks later. At course completion, students' beliefs were more sophisticated in that they believed less in the certainty and simplicity of knowledge. This research provided insight into the possibility that by changing teaching methods and learning environments instructors can influence students' classroom experiences. Tolhurst (2004) cites the work of Brownlee, Purdy, and Boulton-Lewis (2001) as a basis for her study.

Brownlee, Purdy, and Boulton-Lewis (2001) completed a study to determine if a teaching program designed to foster the reflection on and development of more sophisticated epistemological beliefs among pre-service graduate teacher education students in Australia resulted in changes in students' epistemological beliefs. The year long program required students to write their reflections about the content of an educational psychology less in relation to their epistemological beliefs. Students were given Schommer's Epistemological Beliefs Questionnaire (1990) and were divided into a research group (RG) and a comparison group (CG). Beliefs were measured prior to the course and after the course for both groups. Interviews

were completed for both groups. Results indicated that the dimensions of quick learning and certain knowledge showed increased sophistication of beliefs for the research group when compared to the CG students. The qualitative data revealed that the RG students experienced a growth in inconsistent beliefs. Individuals were considered to have inconsistent beliefs when they responded differently to the same concept in the same interview. The authors surmised that the inconsistency of beliefs could be due to the confusion experienced by students who were in the process of wrestling with discrepancies between their old beliefs and new information.

In her exploratory study, Hofer (2004c) suggests that "students' perceptions of instructional practices are interpreted through the lens of their epistemological assumptions" (p. 129). She found that students with a belief in the simplicity of knowledge were comfortable with multiple choice tests and less comfortable with open-ended problems. Students' discomfort was lessened if open-ended practices were explained and if they were given assistance in test preparation. She noted that students whose discomfort was lessened seemed to be developing a more complex view of knowledge as a result. At the same time, the author cautions about inferring change for such a short time span and small number of students. In regard to the certainty of knowledge and instructional practices, Hofer (2004c) found that the students in her study likely moved beyond a dualist view, and she makes suggestions for teaching in regard to these findings. Hofer (2004c) suggests "more work is needed to help students clarify an understanding of basic underlying ideas about knowledge, its origins, and its evolving character within a field" (p. 159). Beliefs about the source of knowledge were also addressed. Based on interviews, it appears that students gave primal importance to the text book over the instructor. Hofer (2004c) suggests that students do not arrive in college as blank slates in regard to either epistemological theories or

beliefs about disciplines. On the other hand, she also suggests that instructors can influence students' beliefs in multiple ways as they evolve (Hofer, 2004c).

Many studies in epistemological literature address students' beliefs and their relation to attitudes, cognitive strategies, learning outcomes and motivation (Hofer & Pintrich, 1997; Kardash & Scholes, 1996; Kember, 2001; Paulsen & Feldman, 1999; Qian & Alvermann, 1995; Rukavina & Daneman, 1996; Ryan, 1984; Schommer, 1988, 1990, 1993a, 1993b; Schraw, Dunkle, & Bendixen, 1995). Other studies considered the influence of classroom learning environments on epistemological beliefs (Brownlee, Purdy, and Boulton-Lewis, 2001; Hofer, 2004c; Jehng, et al, 1993; Tolhurst, 2004). It is evident that personal epistemology has an impact on students' experiences in the classroom. Since I considered the importance of faculty epistemological beliefs on students' experiences in this study, it must be established that student-faculty interaction matters; therefore, a portion of the review below is dedicated to the importance of the relationship between student and teacher as students attempt to become integrated into the academic community.

Student-Faculty Interaction

The National Survey of Student Engagement (NSSE) (2001) outlines five indicators or benchmarks of effective educational practices in higher education. Student-faculty interaction is listed as one of those five benchmarks. The report lists the following activities as forms of interaction: discussing grades or assignments with an instructor, talking about career plans with a faculty member, discussing ideas from class assignments with faculty members outside of class, working with faculty members on activities other than coursework (committees, orientation, student-life activities), receiving prompt feedback from faculty on academic performance, and working with a faculty member on a research project. While it is generally understood that the

quality and quantity of faculty-student interaction affects student experiences, it is unclear how teachers' and students' epistemological beliefs influence those interactions.

Research on student-faculty interaction suggests the importance of these interactions to students' achievements in college (Astin, 1993; Pascarella & Terenzini, 1991; Tinto, 1993). In Astin's (1984) theory of student involvement, highly involved students devote a large amount of physical and psychological energy to their academic experience. According to his theory, the greater the student's involvement, the greater the amount of student learning and personal development (Astin, 1984). In his longitudinal study of more than 25,000 students at over 200 institutions, Astin (1993) reveals that student-faculty interaction had positive correlations with every self-reported area of intellectual and personal growth. Interaction was also positively correlated with personality and attitudinal outcomes (e.g., scholarship, social activism, leadership, and artistic inclination). The measure of student-faculty interaction included being a guest in a professor's home, working on a professor's research project, assisting faculty with teaching a class, and talking with faculty outside of class. Student-faculty interaction had significant positive correlations with every academic attainment outcome to include: college GPA, degree attainment, graduating with honors, and enrollment in a professional or graduate school. Astin (1993) also relays that student-faculty interaction positively correlated with behavioral outcomes, such as tutoring other students, election to a student office, and career outcomes like choosing a career in college teaching.

Tinto (1993) also advises that students who become involved with faculty and other students are more likely to become integrated into the academic and social realms of the institution leading to the greater likelihood of their persistence. He suggests that student and faculty

interaction plays a major role in students' judgments of their intellectual congruence with others at the institution.

Pascarella and Terenzini (1980) found that the quality and impact of student-faculty informal contacts may be as important to student's institutional integration and subsequent persistence as the number of interactions. They developed a scale to measure student interactions with faculty and found that student-faculty interaction scores were better predictors of students' subsequent decisions to persist or withdraw than the scores on students' peer relationship scale. In their later work, which is a synthesis of research evidence, Pascarella and Terenzini (1991) frequently cite student interactions with faculty as having positive impacts on students' experiences. For example, they refer to the importance of faculty-student interaction in the areas of student learning, attitudes, behaviors, values, cognitive skills, occupational values and institutional persistence.

Rendón (1994) advises that most nontraditional students are not likely to get involved academically and socially just as students with a lack of academic and psychological preparedness are less likely to get involved. In addition, students who feel lost in an academic environment or have a fear of failure will hesitate in becoming engaged. She suggests that faculty help students get involved by creating validating academic and social communities both inside and outside of the classroom. In her keynote address to American River Community College, Rendón challenge the notion of involvement as campuses' roles being too passive and waiting for students to become involved. On the other hand, the author recommends validation whereby faculty and staff actively reach out to students and affirm them as being capable and supported in their efforts. One of her recommendations for creating in-class, validating

communities is for faculty to be aware that students come to the community college already as knowers with powerful learning experiences.

In Hirschy and Wilson's (2002) narrative on the sociology of the classroom and its influence on student learning, they emphasize the importance of student faculty classroom interactions. The authors suggest that these interactions affect the classroom climate and student learning and students' perceptions of the instructor influence the amount of academic effort students exert. A study by Volkwein and Cabrera (1998) found students who perceived high levels of faculty concern and student-faculty interaction reported the most beneficial class experiences. While positive interactions between student and instructor usually come to mind, Hirschy and Wilson's (2002) review relays how deleterious effects of classroom interactions exist as well. Examples of negative effects include when professors discriminate against women, do not respect various learning styles, and do not consider barriers of students from working class backgrounds. Instructors have the potential to affect student learning by the pedagogical choices they make and by the environment they encourage through their interactions with students.

In his study measuring student satisfaction in the areas of faculty-student relations, assessment of the academic atmosphere, campus climate and overall assessment of their college experience, Eimers (2000) found that "among minority and nonminority students, increases in progress in college were noted as the student's satisfaction with faculty-student contact, campus climate, academic quality and the overall assessment improved" (p. 9). Satisfaction with faculty-student relations, the quality of the academic program, and the campus environment were closely related to a student's progress in specific areas of math and science development, intellectual and skill development, career development and problem-solving.

Chang (2005) notes that while much of the research regarding the importance of faculty-student interaction is based on participants who attend four-year institutions, very little research has been completed on students at two-year institutions. Her study examines the levels of faculty-student interaction on two-year college campuses. Specifically, she examines how student background characteristics and college environments lead to faculty-student interaction and if these interactions varied by race. Results indicate that students are more likely to interact with faculty in class and these interactions pertain to topics related to the course they are taking, and they are less likely to meet with their instructors outside of class. According to Chang, students who grew up in the American educational system, have highly educated parents, and possess positive and confident attitudes toward school tend to engage more often with faculty. Also, student interaction with members of the college community and students' perceptions of supportive and encouraging teachers, show strong positive correlations with frequent faculty-student interactions. The study also reveals that African American students had the highest frequency of interaction with faculty. In a study of American community colleges, Coley (2000) found somewhat different results. It was found that nearly 50 percent of students participated in study groups for classes and almost 70 percent of these students speak with faculty outside of class. This last finding is in contrast to Chang's finding that most interactions occur in class.

Hagedorn, Maxwell, Rodriguez, Hocevar and Fillpot (2000) suggest that "student development literature on students' social and academic situations needs an approach that is more distinctively relevant to community colleges" (p. 596). Further, researchers suggest that discrepant results in regard to social and academic integration of community college students and university students could be due in part to the very different student bodies and environments of these two institutions (Chang, 2005; Hagedorn, et al., 2000; Maxwell, 2000; Wild & Ebbers,

2002). Hagedorn et al. (2000) came to this conclusion after their findings indicated that community college students do not engage in the same type of activities as their four-year counterparts. Extracurricular activities such as student clubs, athletic events, and artistic events were not priorities for community college students. They found that the classroom is the student's focal point of contact with the college.

Student-faculty interaction plays a vital role in the experiences of college students and satisfaction with interaction has been shown to influence students' grades, degree attainment, career aspirations, student learning, academic efforts and persistence (Astin, 1993; Hirschy & Wilson, 2002; Pascarella & Terenzini, 1991; Tinto, 1993). Student-faculty interaction in the community college classroom is crucial to students and likely influences their involvement levels with the academic system of the college (Chang, 2005; Eimers, 2000; Volkwein & Cabrera 1998). Hirschy and Wilson (2002) report that faculty members influence classroom experiences by pedagogical choices they make and the environments they create through interactions with students. Rendón (1994) suggests the importance of faculty in validating students as knowers with past learning experiences. Faculty members, like students, enter the classroom with their own set of beliefs about the nature and origin of knowledge and learning. Through their formal and informal interactions with students, teachers' beliefs are liable to impact, either directly or indirectly, students' classroom experiences. This next section will review literature related to teachers' epistemological beliefs.

Teachers' Epistemological Beliefs

Despite the integral role faculty possess, Schraw and Olafson (2002) report that very little epistemological research focuses on the role of teachers' epistemological beliefs and how their views affect classroom practices. Findings of their work indicate that teachers are unaware of

their beliefs and the ways they affect teaching practices. In their mixed method study, they examine the implications of teachers' beliefs about knowledge by comparing teachers' world views to their choices regarding curriculum, pedagogy, and assessment. Teachers completed the Epistemic Beliefs Inventory (Schraw, Bendixen & Dunkle, 2002), Need for Cognition Scale (Cacioppo, Petty, Feinstein & Jarvis, 1996), and the Motivation for Teaching Scale (constructed for their study). Interviews were also completed. Results indicate that there are a few clear links between the teachers' epistemological world views and teaching practices. Their findings suggest that most teachers adopt a teacher-centered, transmissional view of teaching even when it is not the view they support in theory. Put simply, they found a discrepancy between what teachers say and what they do.

Yet, this study was met by reviewer critiques directed at the reported disjuncture between teachers' world views and their teaching practices as well as the construct of "world views" (Hofer, 2002b; Pape & Hoy, 2002; Schoenfeld, 2002). The reviewers note that actual teaching practices were not observed, and instead, teachers were asked to report on their practices. In addition, there was some critique of the construct of "world view." Hofer (2002b) suggests that the authors needed to demonstrate that these world views exist at the individual level and whether or not these views are as inclusive and consistent as they assume. Pape and Hoy (2002) also suggest that teachers' epistemological profiles would be more appropriate than characterizing teachers' thinking as single categories. They believed the categories to be oversimplified and Schoenfeld (2002) deemed the categories as not distinct enough. Olafson and Schraw (2002) report that there were 10 reviewers who responded to their paper, which reinforced their main goal of the study which was to begin dialogue among scholars on the relationship between teachers' beliefs and practices.

In other studies, researchers have considered the impact of teachers' epistemological assumptions on students' experiences. Beers and Bloomingdale (1983) found teachers' epistemological assumptions to be related to perceptions of students' difficulties. Teachers who viewed the world in terms of absolute truths assigned cause of the difficulties to the relatively stable characteristics of talent and personality. If an instructor espouses these views, it is likely that students' classroom experiences will be affected. For example, as Beers and Bloomingdale (1983) suggest if attributions are associated with the instructors' epistemological beliefs rather than students' characteristics, teachers might give up on students too quickly.

Scheurman (1996) also completed a study regarding faculty members' assumptions about college students' reasoning. He found that many professors assumed that their students possess epistemic beliefs consistent with the earliest levels of epistemological thought based on the King and Kitchener's (1994) Reflective Judgment Model. In addition, the instructors viewed their own approaches to reasoning as being a part of the very highest stages. It is interesting to consider the student who may actually have more sophisticated epistemological beliefs but must complete assignments created by faculty who assume the student possesses naïve beliefs. Scheurman (1996) relays possible implications of this type of thinking and how there is a potential for a self-fulfilling danger of these beliefs. The author discussed how student apathy and boredom could be a result of these faculty beliefs and results of the low expectations faculty have for students' abilities.

Dawn Schrader (2004) suggests that classrooms that feel intellectually safe to students, resulting in more conducive learning environments, are derived from a moral atmosphere and an epistemological "fit" between teacher and student. According to Schrader, a moral climate in the classroom is one where the instructor models respect, critical reflection, inclusiveness, and

support. Schrader (2004) hypothesized that even if a moral climate is present**,** there may be tension between students' and professors' epistemological perspectives or fit. The instructor may challenge students to think beyond their ways of knowing that feel comfortable, and the learning experience may not fit the students' epistemological perspectives. For instance, the teacher may validate contradictory viewpoints or focus on construction of knowledge rather than on disseminating knowledge (Shrader, 2004). On the other hand, students who feel supported in their views and safe to speak their mind and question their assumptions will more likely accept the challenge of a new way of thinking and be more apt to adopt new views. This event is described as "epistemic stretch" (Schrader, 2004). In other words, students must first be met or valued at their initial level of epistemic thought before being able to accept new epistemologies.

Undoubtedly, instructors' beliefs about learning and knowing influence classroom activities and the ways they view students' learning and beliefs. Therefore, this study considered instructors' beliefs and how the congruency of teacher and student beliefs are related to students' experiences.

Community College Learning Environments

Community colleges, public and private, educate almost half of all United States undergraduates each year (Laanan, 2003). The earliest community colleges were founded in the early 20th century in response to the need to train workers to operate the nation's expanding industries as well as the lengthened period of adolescence and the drive for social equality (Cohen & Brawer, 2003). For many students, the community college serves as their only entry into higher education because of the colleges open admissions policy.

Two defining characteristics of today's community collegse are the college's commitments to a broad range of students and their entrepreneurial spirit which consists of a willingness to accept

new roles and expand into new markets (Grubb, 1999). There are numerous reasons that individuals attend the over 1,100 community colleges across the United States. Besides open admission policies, community colleges typically offer lower tuition than their four-year counterparts, transfer programs to four-year institutions, convenient locations for students with families or no transportation, convenient course times, and remedial education course offerings (Phillippe & Patton, 2000). Bryant (2001) explains that students attend community colleges for the following reasons: to better themselves financially, to obtain job skills, to upgrade job skills, to fulfill a personal interest or to take classes that will transfer to senior institutions. Community colleges are traditionally known for having a more diverse student population (Bryant, 2001). Approximately 59 percent of community college students enrolled in 2003-2004 were women, and non-white students constituted almost 40 percent of community college enrollments nationally (NCES, 2006).

Grubb (1999) posited that community colleges are often called "second-chance" institutions because they provide a second opportunity for students who were not motivated or performed poorly in their secondary education and could not gain admittance to a four-year institution. Community colleges often respond to the need of the community in which they resides to offer various educational programs. Grubb (1999) makes an important point by stating that sometimes the commitment to diversity and the entrepreneurial spirit have their costs. According to Grubb, one cost refers to the difficulties faced by faculty, for instance, the pedagogical challenges in providing instruction and meeting the needs of a diverse student population. Since these colleges typically are very responsive to the local community's needs and sensitive to changing economic and demographic conditions, a second cost is related to the fragmentation of community colleges due to commitments to expanding enrollments and revenues (Grubb, 1999). Bryant (2001) also

notes that community colleges are often pulled in many directions as a result of the various roles they subscribes to fulfill. This fragmentation often results in the undermining of institutional support for teaching in several ways because of the commitment to expanding enrollments and revenues (Grubb, 1999). The very attributes that make the colleges unique create pedagogical choices that go unresolved and unrecognized (Grubb, 1999). On the other hand, Astin (1993) recognizes that community colleges offer smaller classes which are most likely taught by faculty members and not teaching assistants. Community colleges are traditionally considered to be more focused on teaching since faculty members are not required to complete research. Grubb (1999) discussed how there is very little research on community college teaching. Through his book, *Honored But Invisible: An Inside Look at Teaching in Community Colleges,* Grubb wishes to make instruction at these institutions more visible.

In his study involving interviews with 260 instructors and 60 administrators at community colleges, Grubb (1999) observed over 250 classes. The teaching methods were varied and there was evidence of good and bad teaching. Classrooms ranged from lively, interactive classes to boring, stagnant classes where students were resistant to participate. Based on his observations, the author states that an overriding principle of good teaching is equilibrium between students and instructors in the form of a common understanding of what education is and what should go on in the classroom. The equilibrium that is most effective, according to Grubb, is the one where "both instructors and students are prepared for the livelier exchanges, the student initiatives and challenges, the student-oriented elaboration and frequent departures from the class "script," and the full range of literacy practices we see in student-centered and constructivist teaching (Grubb, 1999, p. 360). Observations of good teaching, according to Grubb, included instructors who actually observed their students in the beginning of the semester to determine what worked and

what did not for different students. They made no assumptions about what the students needed to succeed or what interested them. It seems that these teachers met the students at their current approaches to learning and participation and did not assume or impose their own beliefs about or how the students should participate or approach learning. Similarly, Hofer (2004c) suggests that faculty may be most effective when they are able to consider that "students filter their perceptions of instructional practice through their own epistemological perspectives" (p. 161). She further proposes that teachers "take such filters into account, address epistemological assumptions, provide the rationale for particular instructional practices, and address not only what there is to know in a field, but how it is we know, and how what we know can be justified" (Hofer, 2004c, pp. 161-162).

Grubb (1999) also found that classes break down when disequilibrium arises. In Grubb's view, disequilibrium is evidenced by the instructor who complains that their students simply read and accept anything someone says; however, the instructor does not socialize the students to be more critical or provide the necessary preparation for them to participate more fully. In this situation, instructors must pull responses from their students, and do all of the intellectual work. Oftentime, therefore, they subsequently revert to the lecture only format (Grubb, 1999). The author also discussed another form of disequilibrium titled the "distressed" class (p. 360). This type of class occurs when the instructor holds on to authority to explain content when students wish to challenge and seek new sources of information. These classes are ones "where overt challenges to the instructor's authority bring the class to a halt" (Grubb, 1999, p. 360).

There are numerous ways that disequilibrium can arise but in most cases it is the result of instructors who have failed to understand their students and failed to re-socialize them; and this failure results in student learning being undermined (Grubb, 1999). In one particular class,

Grubb noted that the instructor asked complex questions that the students had a difficult time understanding, in part, due to the instructor's presentation of theory as fact. There was very little participation among the class, and the students were not able to connect the information to their lives. It is possible that epistemological beliefs of students and teachers come into play in Grubb's descriptions of disequilibrium.

Grubb's concept of equilibrium between student and teacher is an important concept in regard to this study. Perhaps, epistemological congruency is relevant in understanding how equilibrium occurs or does not occur in a classroom. When instructors' and students' beliefs about the nature of knowledge and learning are different and no attempts are made to understand either perspective, disequilibrium could result.

Student Retention and Academic Integration

One of the most acclaimed theories of retention is Tinto's (1975, 1987, 1993) theory of academic and social integration. Tinto's (1993) theory of student departure suggests that students' decisions to remain at or leave an institution are impacted by the levels of connection they feel with the institution both academically and socially. The theory also acknowledges that students enter the higher education arena with various individual characteristics which include: family and community background (e.g., social status, parental educational level), personal attributes (e.g., race and gender), skills (e.g., intellectual and social), financial resources, dispositions (e.g., intellectual and political preferences), and precollege school experiences (e.g., high school grades) (Tinto, 1993).

Tinto's theory (1993) relates that student entry characteristics influence a students' initial commitment to the institution and the goal of college graduation as well as the decision to withdraw from an institution. Each attribute affects departure indirectly through its effects on

the formulation of intentions and commitments regarding education. Intention refers to the level and type of education desired by the student. "Commitments indicate the degree to which individuals are committed both to the attainment of those goals (goal commitment) and to the institution into which they gain entry (institutional commitment)" (Tinto, 1993, p. 115). Initial commitment to the institution and commitment to the goal of graduation influence the level of integration into the academic and social systems of the college. In addition to individual attributes, Tinto (1993) also acknowledges the importance of experiences within the institution during the student's college career. Internal institutional experiences include interactions with faculty, staff and other members of the college including other students. Tinto claims that positive interactions between students and faculty, staff and other students aid in reinforcing students' social and academic integration, thereby increasing the likelihood of persisting to obtain a college degree. The lower the degree of academic and social integration, the more likely it is that the student will withdraw.

A central idea of Tinto's theory (1993) is that colleges and universities consist of both academic and social systems each possessing their own "formal and informal structure and set of student, staff, and faculty communities" (p. 106). The academic system "concerns itself almost entirely with the formal education of students" (Tinto, 1993, p. 106). The activities of the academic system focus on classrooms and laboratories; however, they also involve the faculty and staff who have a primary role in students' education. The social systems of the institution center around interactions among students, faculty, and staff. These activities generally take place outside of the formal academic arena.

Academic integration is a measure of the students' perceptions of their academic experiences with faculty, counselors, and administrators and includes their perceptions about

their career preparation at their college (Tinto, 1993). Braxton, Milem and Sullivan (2000) denoted that academic integration should not be confused with antecedents or sources of influence on academic integration. Antecedents include active learning and other classroom based teaching practices, whereas academic integration encompasses a student's experiences with the academic systems and communities of a college or university. While academic integration is concerned with formal contacts, Tinto (1993) asserts that social integration is a measure of students' informal contacts with faculty members, counselors, and peer groups. Examples include extracurricular activities like sports teams and membership in clubs and organizations, as well as non-classroom interactions with faculty members and administrators.

Tinto (1993) suggests the importance of the college classroom in retention and notes that it is evident that there is a critical and unexplored link between student learning experiences and student departure. He also proposes that activities occurring in the classrooms are central to the process of student participation in the intellectual life of the institution. The classroom acts as a gateway for student involvement in the academic and social systems of a college and plays a crucial role in the student departure process (Braxton, Milem & Sullivan, 2000; Tinto, Goodshell & Russo, 1993).

According to Tinto's (1993) theory, students may not integrate into the institutional community for two reasons referred to as incongruence and isolation. "Incongruence refers in general to the mismatch or lack of fit between the needs, interests, and preferences of the individual and those of the institution" (Tinto, 1993, p. 50). Tinto (1993) further notes that incongruence may arise from a mismatch between the abilities, skills, and interests of the student and the demands placed on the student by the academic system of the college. For example, Tinto (1993) describes how students might feel that the institution's intellectual climate does not

suit them, is irrelevant, or contrary to their intellectual preferences. In this state, individuals feel they are at odds with the institution and, as a result, they do not desire to integrate (Tinto, 1993). Epistemological congruence or incongruence between faculty and student beliefs may (either directly or indirectly) influence students' fit with the institution and ultimately their levels of academic integration. Perhaps, epistemological congruence is part of Tinto's (1993) critical, unexplored link between student classroom experiences and student departure.

Since this study will involve community college students, results of retention studies in community colleges that were based on Tinto's model will be reviewed. The purpose of the review is to establish the importance of academic integration to this population of students. It is important to note that research on retention in community colleges is deficient (Strauss & Volkwein, 2004; Wild & Ebbers, 2002). A review of the literature indicates when applying Tinto's model to community and commuter colleges, many findings point to academic integration as having direct and indirect effects on persistence at community colleges (Bers & Smith, 1991; Napoli & Wortman, 1996, 1998; Nora, Attinasi & Matonak, 1990; Pascarella, Smart & Ethington, 1986), and commuter colleges (Fox, 1986; Pascarella, Duby & Iverson, 1983).

Bers and Smith (1991) completed a study to determine the extent to which social and academic integration, student educational objectives, and intent to reenroll are predictive of persistence for community college students. They concluded that their study supported and extended what is known about the influence of academic and social integration, students' educational objectives and intent to reenroll on community college student persistence. Bers and Smith (1991) report that students' scores on scales of academic and social integration differentiated persisters from non-persisters. Their measures of social and academic integration

were based on Pascarella and Terenzini's (1980) Student Involvement Questionnaire (SIQ). Academic integration scales included two sets of items. The first set centered around students' academic and intellectual development such as: satisfaction with intellectual development, positive influence of academic experiences and influence on intellectual growth and interest in ideas, confidence with decision to attend particular college, interest in ideas and intellectual matters since attending college and academic performance. The second set of items included: positive influences of nonclassroom interactions with faculty on students' personal growth, values, and attitudes, positive influence of nonclassroom interactions on students' intellectual growth, and interest in ideas, positive influence of nonclassroom interactions on students' career goal and aspirations, satisfaction with opportunities to meet and interact informally with faculty members, faculty interest in helping students grow in more than just academic areas and general interest in students by faculty members.

Fox (1986) reports that Tinto's (1982) model was useful in characterizing student-institutional fit at a commuter institution. In Fox's study, the participants were students with economic or educational disadvantage. Results indicate that both academic and social integration impact persistence; however, academic integration was a stronger predictor of freshman year retention in an ethnic minority sample at commuter colleges. In a similar study, Nora, Attinasi and Matonak (1990) investigate the predictive accuracy of Tinto's (1975) theoretical model of student attrition among students enrolled in developmental courses at a two-year community college. They examined the direct and indirect effects of four exogenous variables (family background, precollege schooling, getting ready, and encouragement by significant others) and three endogenous variables (initial commitments, academic integration, and social integration) on student retention. The authors state that their results support the constructs in Tinto's (1975)

model. They found a direct, positive effect of academic integration on retention. Items related to academic integration include: students' perceptions of their academic experiences, the frequency of academic involvement, the frequency of study behavior and their grade performance. Items related to social integration included: both the students' perceptions of their social interactions with faculty and students and also the frequency of their involvement in social activities. Social integration; however, was found to have a negative influence on retention. A nonsignificant, negative relationship was found between initial commitments and retention. Pre-college schooling, defined operationally as students' self-reports of high school grades, had a positive relationship with retention.

Napoli and Wortman (1998) completed a study to assess the validity of Tinto's (1975, 1987, 1993) model in the community college setting. A second goal of their study was to extend and refine Tinto's model by examining the mediational influences of a set of psychosocial measures (e.g., life events occurring during the first semester of college, social support, self-esteem, social competence, personal conscientiousness, psychological well-being, and satisfaction with the academic, administrative, and social systems of college) on the constructs in Tinto's (1987, 1993) model. Measures of academic integration included the Student Involvement Questionnaire-Academic Integration (SIQ-AI) (Pascarella & Terenzini, 1980) and the Academic Adjustment Scale of the Student Adaptation to College Questionnaire (SACQ-AA) (Baker & Sirk, 1989). Example items included: attending class on a regular basis, keeping up to date with academic work, allocating sufficient time to study, and enjoying the academic demands of college. They found that the more academically integrated students had higher academic achievement and initial goal commitment. From a psychological standpoint, academic integration was higher among students who were more conscientious, who had grater self-

esteem, and who were more psychologically adjusted. Academic integration was greater for individuals with greater social support in school. Individuals with greater negative life events (not related to school) also experienced greater academic integration. Results confirmed the generalizability of the model to two-year students.

Pascarella, Smart, and Ethington (1986) completed a national study involving 85 two-year institutions based on Tinto's (1975) theory to explain the long term persistence/withdrawal behavior of students who initially enrolled in two-year institutions. According to their results, measures of social and academic integration had the most consistent pattern of positive direct effects and the influence of student precollege traits had more indirect effects. Further, social integration yielded consistently significant direct effects on both measures of persistence (degree completion and degree persistence) for both women and men.

Another study examined factors that influence student commitment and investigated the similarities and differences at two-year and four-institutions. Strauss and Volkwein (2004) examined the predictors of institutional commitments of first-year students at 28 two-year and 23 four-year public institutions. Results indicated that the most important influences were the measures of academic integration and growth followed by social integration and growth. Specifically, three of the five scales (classroom experiences, faculty interaction, and intellectual growth) that reflect academic integration and academic growth are included in their final model. The impact of classroom experiences on commitment was one of the strongest in the study. In comparing two-and four-year institutions, classroom experience proved to be a more influential predictor at two-year institutions.

In-class experiences are particularly important to community college students (Strauss & Volkwein, 2004), since they may not engage in out-of-class activities (Chang, 2005; Tinto,

1993). It follows then that academic integration has more direct effects on persistence in community colleges. Academic integration centers around students' academic experiences and interactions with faculty (Tinto, 1993). It is possible that students' and faculty members' epistemological beliefs affect these interactions resulting in positive or negative experiences. It is interesting to consider whether the congruency of beliefs leads to more positive interactions. Positive interactions have been shown to increase students' satisfaction with college experiences which, in turn, have influenced students' persistence (Astin, 1993; Hirschy & Wilson, 2002; Pascarella & Terenzini, 1991).

There appears to be no study that considers the congruency of epistemological beliefs between students and faculty members and the relationship between congruency and academic integration; however, research suggests that epistemological beliefs influence attitudes toward education as well as academic performance (Hofer & Pintrich, 1997; Kardash & Scholes, 1996; Kember, 2001; Paulsen & Feldman, 1999; Rukavina & Daneman, 1996; Ryan, 1984; Qian & Alvermann, 1995; Schommer, 1988, 1990, 1993a, Schraw, Dunkle, & Bendixen, 1995). The community college, traditionally known for its teaching focus, may provide a rich context in which epistemological congruency, as a facet of integration, plays a particularly strong role in shaping students' experiences.

It appears that the community college classroom is pivotal in students' academic experiences since academic integration is particularly important in this setting. Since this study considered the relationship of epistemological congruency between teachers and students as well as academic integration, the community college offered a rich setting for this study. Further, given that academic integration positively influences retention, this study considered whether epistemological congruency is related to students' intentions to persist at the college.

Community college students make up a large proportion of undergraduate population in the United States; yet, we know little about these students' experiences. What we do know is that many students who attend these colleges are academically underprepared (Tinto, 1993) and that retention is a problem at these campuses (Jacobsen, 2005). This study focused on the community college classroom to offer insight into an understudied and often over-looked population of learners and teachers.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to provide an overview of the methodological and theoretical frameworks of this study, as well as to articulate the research design, methods and data collection and analysis procedures. In addition, methods for establishing the trustworthiness of the inquiry and findings are discussed.

The main research question that guided this study was:

How does epistemological congruency affect students' experiences?

The research sub-questions are:

4. Is there a relationship between epistemological congruency and students' grades? If so, what is the nature of the relationship?
5. Is there a relationship between epistemological congruency and students' academic integration? If so, what is the nature of the relationship?
6. Is there a relationship between epistemological congruency and students' intentions to persist? If so, what is the nature of the relationship?

My interest in students' and teachers' beliefs about knowledge arose from my work as a counselor, advisor, and instructor at a community college. Semester after semester, I talked with students who seemed to have the academic ability necessary for success in the college environment, yet they struggled in their courses or appeared apathetic toward higher learning. I taught several academic skills courses and tried to create a safe learning environment where students would be willing to take risks and hopefully become engaged learners. After introducing assignments that I thought were thought provoking and interesting, I would be met with blank faces or perhaps the question, "Is this on the test?" Then, I would return to a lecture-

only format to ease not only their anxiety but also my own. Other instructors relayed the same experiences.

I began reading some of the literature on personal epistemology and wondered if maybe my line of thinking or my teaching techniques were not in sync with the way my students thought about learning. Reflecting on my own undergraduate experience, I remembered the impatient student I became when instructors did not give me the "right" answers or if they tried to discuss multiple theories with the class. I did not want to hear from my classmates because the instructor was the only one with the knowledge, or so I thought. When I think of these experiences today, I am saddened by the interesting discussions and knowledge I missed. Also, I think about the struggles I faced in graduate school when it was time for me to think critically or to construct my own views and theories. Unfortunately, many who work in higher education do not talk to undergraduate students about their epistemological beliefs and how these beliefs might affect their experiences. My intention in this study is to shed some light on what our students think about knowledge and learning and how the congruency of faculty and student beliefs may or may not relate to students' grades, academic integration, and intentions to persist in school.

Methodological Framework

This study employed a mixed method design that is considered by Tashakkori and Teddlie (1998) to be a parallel/simultaneous design with the qualitative portion being the dominant design**.** In this type of design, the quantitative and qualitative data are collected at the same time and analyzed in a complementary fashion, and the data generated in this study was both narrative and numerical and answer similar questions (Tashakkori & Teddlie, 1998). Green, Caracelli, and Graham (1989) list five purposes for mixed method studies. This study focuses on the purpose of expansion of Green et al. Expansion refers to mixed method design adding breadth

and scope to a project. The desired effect of this mixed method study is that the qualitative portion expanded on and provided further insight into the students' and faculty members' epistemological beliefs and how the congruency of these beliefs relates to students' experiences.

In general, quantitative research focuses on the description and explanation of a research problem, whereas qualitative research seeks to explore and understand a problem (Creswell, 2002). A main goal of qualitative research "is to better understand human behavior and experience. Qualitative researchers seek to grasp the processes by which people construct meaning and to describe what those meanings are" (Bogdan & Biklen, 1998, p. 38). In addition, qualitative research "gives voice" to those who exist on the margins (Bogdan & Biklen, 1998, p. 204). Since the perspectives of community college students and faculty are lacking in higher education literature, the qualitative approach in this study solicited these perspectives and made them available in written form. In addition, literature reviews revealed that there were no studies that consider the congruency between student and faculty epistemological beliefs. A qualitative investigation allowed for exploration of this concept.

Quantitative methodology allows researchers to measure attributes or characteristics (Creswell, 2002). In this study, quantitative methodology was employed to facilitate the qualitative portion of the study. The participants completed an inventory in order to establish epistemological difference (ED) and epistemological congruency. In addition, the theoretical underpinnings of Schommer's (1990, 1994a) theory of epistemological beliefs necessitated the use of quantitative techniques to measure this construct. Students also completed a demographic questionnaire that assisted in gathering relevant background information on all participants. Descriptive statistics were computed to obtain information about the chosen participants

including the means and ranges of their EBI scores. The statistics were used to compare students and faculty to note and significant differences among scores.

Correlations among various epistemological beliefs and students' grades were run to ascertain if there were any relationships between the various dimensions and grades. In addition, correlations were run to ascertain the degree of association between epistemological difference (ED) scores and grades as well as Epistemic Belief Inventory (EBI) scores and grades. The Pearson Product Moment correlation coefficient was utilized to determine these relationships. All statistical analyses were conducted at the .05 level of significance.

Theoretical Framework

The theoretical framework within which this study is based on Tinto's (1993) theory of student departure and Schommer's (1990, 1994a) theory of epistemological beliefs. Through his theory, Tinto suggests that students' decisions to remain at or leave an institution are impacted by the levels of connection they feel with the institution both academically and socially. According to Tinto, students may not integrate into the institutional community for two reasons: incongruence and isolation. Incongruence refers to a mismatch or lack of fit between the needs, interests, and preferences of the individual and those of the institution (Tinto, 1993). In this state, individuals feel they are at odds with the institution and, as a result, they do not desire to integrate and hence may depart. Epistemological congruence or incongruence between faculty and student beliefs may (either directly or indirectly) influence students' fit with the institution and ultimately their levels of academic integration. Research indicates that academic integration is particularly important in two-year college settings (Bers & Smith, 1991; Mulligan & Hennessey, 1990; Napoli & Wortman, 1998; Nora, Attinasi & Matonak, 1990; Pascarella, Smart & Ethington, 1986). Tinto outlined the importance of students' feelings and perceptions of their

academic experiences. A qualitative study lent itself to this line of inquiry in particular as it illuminated students' perceptions of their classroom experiences.

This research was also built around Schommer's (1990, 1994a) theoretical delineation of the facets of epistemology. Schommer (1994a) outlined five dimensions and their corresponding values:

> (1) certainty of knowledge, ranging from knowledge is absolute to knowledge is tentative; (2) structure of knowledge, ranging from knowledge is organized as isolated bits and pieces to knowledge is organized as highly interwoven concepts; (3) source of knowledge, ranging from knowledge is handed down by authority to knowledge is derived through reason; (4) control of knowledge acquisition, ranging from the ability to learn is fixed at birth to the ability to learn can be changed; and (5) the speed of the knowledge acquisition, ranging from knowledge is acquired quickly or not-at-all to knowledge is acquired gradually. (pp.174-175)

The Epistemic Beliefs Inventory (EBI) (Schraw, Dunkle & Bendixen, 1995; Schraw, Bendixen, & Dunkle, 2002), based on Schommer's (1990) theory of beliefs, was administered to the participants to determine where their beliefs lie on the five factors. Based on their responses, epistemological difference scores (ED) between student and teacher were determined. This quantitative information guided interviews with the students and faculty. Interviews provided an opportunity to further delineate students' and faculty members' specific responses on their inventories.

Pilot Study

A pilot study was completed in the Spring semester of 2005 at a community college located in the Southeastern United States. The main purpose of this study was to validate interview protocol methods focused on answering the question: How does the level of faculty-student

epistemological congruency affect students' experiences and integration into the academic community? Specifically, the Epistemic Beliefs Inventory (EBI) (Appendix A) was administered to 28 students and the faculty member in an introductory psychology course at a community college. The community college setting was selected since academic integration is particularly important at community colleges (Nora, Attinasi & Matonak, 1990; Napoli & Wortman, 1996). An introductory psychology class was chosen due to the wide range of academic majors represented.

The EBI was developed by Schraw, Bendixen and Dunkle (1995) and was modeled after Schommer's (1990) four factor instrument, the Epistemological Questionnaire. The EBI (Schraw, et al., 1995) is designed to measure the respondents' beliefs about:

> (1) certain knowledge (CK), (i.e. absolute knowledge exists and will eventually be known), (2) simple knowledge (SK), (i.e. knowledge consists of discrete facts) (3) omniscient authority (OA), (i.e. authorities have access to otherwise inaccessible knowledge, (3) quick learning (QL), (i.e. learning occurs in a quick or not-at-all fashion), and (5) fixed ability (FA), (i.e. the ability to acquire knowledge is fixed) (p. 525).

Responses on the EBI range from 1 (strongly disagree) to 5 (strongly agree). I chose this inventory due to its brevity in comparison to Schommer's (EQ), and because it yielded higher predictive validity in terms of reading comprehension and test-retest reliability than the EQ in a comparison study (Schraw, Dunkle & Bendixen, 2002). The higher the score on each scale of the inventory, the stronger the participant's belief in that particular facet of knowledge. The highest possible score on each of the scales is as follows: QL= (25), FA= (35), SK= (35), CK= (40), and OA = (25).

After determining the scores on the five dimensions of epistemology as measure by the EBI, high and low Epistemological Congruency Scores were determined. Specifically, the deviation scores between each student and instructor, across all five categories, were added. Based on these scores, the students who were most similar to and different from the instructor in terms of epistemological beliefs were determined. Two students with high epistemological congruency and two students with low epistemological congruency, as well as the instructor, were interviewed. Interview protocol (Appendix B)focused on the five theoretical areas articulated by Schommer (1990). In order to assess how this particular class may have affected students' overall college experiences, as well as intent to persist, students were asked: If every class you took were like this one, how likely do you think it is that you would remain in school? An interview with the instructor was completed to understand further how beliefs may affect the in-class interactions between instructor and student and ultimately the students' academic integration.

In order to best understand the experiences of the four students interviewed, each of these students was viewed as an individual case. Specifically, four extreme cases, two with low epistemological congruency and two with high epistemological congruency were chosen. The data were analyzed in a contextualized fashion in order to best understand the students holistically (Tashakkori & Teddlie, 1998).

Based on all four interviews, it was evident that the students liked their instructor. They felt respected and cared for by this teacher. Even when students acknowledged there may have been something that they would change in their class experience, they never criticized the actions of the teacher. In addition, the highly congruent students recanted their grievances immediately after stating them. The two students with low epistemological congruency students more clearly

explained their difficulties in class and did not immediately dismiss them. Both of the students with low epistemological congruency students seemed to have taken the semester to resolve or adapt to the situation. On the other hand, the highly congruent students claimed responsibility from the beginning for any shortcoming.

The instructor's accounts of classroom interactions with the four students surprisingly revealed that the low epistemologically congruent students were somewhat more successful in her course. It is possible that these students were more challenged in this setting, due to their low congruency with their instructor. Feeling more challenged could have led these students to rise to the occasion. Forsyth and McMillan (1998) suggest that presenting material in a challenging way capitalizes on intrinsic motivation.

After completing this pilot study, I felt there were several issues which needed to be addressed in my next study. First, I did not spend enough time with these students for a deeper understanding of their experiences. Second, I felt there was a missing piece in regard to classroom activities. If epistemological congruency matters in the classroom, then it is important to know how it is played out in the classroom. To address this concern in this current study, I have added faculty interviews and observations of classrooms to further address congruency of beliefs between teachers and students.

Pre-Study Activities

Prior to my initial visit to my site, I obtained IRB approval (IRB #3226). Appropriate IRB documentation was submitted to the contact at the chosen college. This individual was provided with the IRB forms and a detailed abstract of the study as per their request. Copies of the EBI and interview protocol were also submitted. The college accepted my request for the study and provided me with office space and permission to contact faculty members and students.

Confidentiality

All participants and the college were assigned a pseudonym to protect their identities. All students and faculty completed a consent form and were given a copy of this form. (Appendix C)

Research Design

Student Case Studies

In his definition of case studies, Creswell (1998 as cited in 2002) wrote:

> Some researchers identify "case" as an object of study (Stake, 1995), others consider it to be a procedure of inquiry (e.g., Merriam, 1998). A *case study* is an in-depth exploration of a bounded system (e.g., an activity, event process, or individuals) based on extensive data collection. (p. 485)

Similarly, Gall, Borg, and Gall (1996) define case study research as "The in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon" (p. 545). Since I wished to explore how epistemological congruency relates to community college students' experiences, this design was needed to spend time with students in their setting, to gain insight into their realities.

Gall, Borg, and Gall (1996) describe four characteristics of case study research:

> (1) the study of phenomena by focusing on specific instances, that is, cases; (2) an in-depth study of each case; (3) the study of a phenomenon in its natural context; and (4) the study of the emic perspective of case study participants. (p. 545)

In this study, the cases to be studied were the eight individuals chosen for the study. The phenomenon explored was students' experiences with congruent or incongruent instructors. I met with each student participant on two occasions in the semester to learn of their experiences

in their courses through interviews and observations. Two students were met with on one additional occasion to clarify information gathered from the first interview.

Creswell (2002) also outlined three types of cases that qualitative researchers often study: intrinsic, instrumental, and collective. According to his description, my case study is considered instrumental. An instrumental case study "serves the purpose of illuminating a particular issue" (Creswell, 2002, p. 485). Likewise, Stake (2000) defines instrumental cases as those where particular cases or individual participants' experiences are examined to provide insight into an issue. The use of the case study design assisted in illuminating epistemological beliefs of students and teachers and how these beliefs were related to various student experiences.

Setting

The setting for this study was a community college in the Southeastern United States, which will be called Cypress College throughout this document. The college is located in an urban area of the state. The college offers students various educational options to become gainfully employed in the community or to transfer to a four-year institution. The college provides the following options: (1) general education courses and associate degree programs that transfer to four-year institutions, (2) associate degrees in numerous fields, (3) developmental courses to assist academically underprepared students for college level work, (4) career training and technical skill development, and (5) continuing education courses.

Cypress College employs approximately 60 full time faculty and staff members as well as numerous adjunct instructors. Its student population consists of approximately 2000. This college is currently located in one building but plans are in process for additional space. The college is an open admissions institution that places students in courses according to their American College Test (ACT) scores or by on-site placement testing if no scores are available.

Part of the college's vision is to meet the workforce needs of the community in which it resides. Therefore, the college partners with local businesses to remain abreast of local industry needs. Some of the college's goals are: to develop positive relationships with the local community and the state, offer student services to complement the academic system, provide a safe environment, and offer instruction that enhances student learning and success. Career and counseling services, academic advising and a learning resource center are available for students. Tutoring is also offered free of charge for some general education courses.

This study was limited to one site in order to obtain greater depth of experiences for a smaller number of people. Patton (2002) discussed that there are trade-offs when choosing a research design. According to Patton (2002), qualitative methods allow inquiry into selected issues in great depth with "careful attention to detail, context, and nuance" (p. 227). Since epistemological beliefs are rarely discussed in class and many students are not aware of their beliefs, it can be a difficult construct to capture. It was of primary importance to gain a clear understanding of how the congruency of beliefs between teacher and student relates to students' experiences. One site afforded the opportunity of greater depth and a broader range of experiences for a smaller number of people rather than a narrow range of experiences for a larger group of people (Patton, 2002).

Sample

Students. On the day of the initial meeting, 17 of the enrolled 22 students were present. All 17 of the students and the instructor in a college required, freshman level liberal arts course completed a demographic form and the Epistemic Beliefs Inventory (EBI). They were also given a consent form (Appendix C). This class was chosen based on purposive sampling. Tashakkori and Teddlie (1998) stated that this type of sampling is done on basis of information available

about the individuals or groups. This class was in part chosen due to the availability of the instructor on campus which would allow for his greater opportunity for study participation. In addition, since students in all degree programs were required to take this liberal arts course, there would be a variety of students from various majors with diverse career goals. This variability is important when considering transferability of findings to other community college students. Selected student participants were enrolled in at least nine hours in that particular semester so that students would have more than one other instructor to choose for a second interview.

After determining students' scores on the five dimensions of epistemology to include omniscient authority (OA), certain knowledge (CK), quick learning (QL), simple knowledge (SK), and fixed ability (FA), as measured by the EBI, high and low epistemological difference scores were determined. Specifically, the deviation scores between student and faculty, across all five categories were calculated resulting in the epistemological difference (ED) score.

Eight students were chosen to participate in this study out of the 17 students who completed the EBI in the liberal arts course. The eight students were chosen based on their epistemological difference (ED) score with the instructor. The higher the ED score, the more difference between student and instructor. Higher ED scores indicate lower epistemological congruence while lower ED scores indicate higher epistemological congruence. One student with high congruence initially chosen was removed from the study because she was enrolled in only six hours. Her ED score with Mr. Henricksen was a 6. The next student in line with high congruency was chosen and her ED score with Mr. Henricksen was a 12. In addition, another student with an ED score of 24 would have been chosen as a lower congruent student; however, that student could not be reached. Subsequently a student with a 19, which was the next highest ED score, was chosen, and this student agreed to participate.

Students with levels of low and high congruence with their instructors were chosen; therefore, the sampling procedure is considered sampling for heterogeneity. Taskakkori and Teddlie (1998) stated that sampling for heterogeneity "provides the maximum heterogeneity on certain attributes (e.g., ethnicity, education) that are important to the research objective of the study" (p. 76).

Faculty. The liberal arts instructor, given the pseudonym of Mr. Henricksen, completed the EBI and an interview, and his class was observed. Purposive sampling was used to select subsequent teachers to be interviewed, observed, and chosen for EBI completion. These instructors were selected based on the students' interview information and based on the desire to obtain diversity of student experiences, which may or may not be related to epistemological congruency. During the first interview, if a student did not feel "in sync" with the liberal arts instructor, then another instructor was chosen with whom the student felt more in sync. If the student felt "in sync" with the liberal arts instructor, then another faculty member was chosen with whom the student did not feel "in sync." The term "in sync" refers to students' assessment of their comfort or coexistence with their instructor. Specific attention was given to students' feelings in the classroom in regard to the instructors' teaching styles, class work and assignments, and the students' overall impressions of the instructor as a teacher. Four students chose instructors they felt more in sync with and four students chose instructors with whom they felt less in sync.

Data Collection

In case study research, multiple sources of information are used to explore the phenomenon (Yin, 2003). Yin (1994) suggests guiding principles for data collection should include multiple sources of evidence from two or more sources that converge on the same facts or findings. A second principle includes a chain of evidence which offers "explicit links between the questions

asked, the data collected, and the conclusions drawn" (Yin, 1994, p. 78). In this study, data were collected through interviews, observations and inventories. First, student interviews were completed in February 2006 to learn more about students' epistemological beliefs and their perceptions about classroom experiences before observations took place. The second student interviews did not occur until April when the student had spent time in the classroom and on campus interacting with faculty. Observations of the classroom occurred on two occasions. The first set of student/faculty observations consisted of the eight students chosen for the case studies and the instructor from the initial liberal arts course. The second set of observations included the same eight students and seven other instructors suggested by the students.

Student Demographic Information

Each participant will complete a demographic form (Appendix D). All students in the initial chosen sample (entire class) completed this form. Demographic data included the following: race, gender, age, parental education level, reasons for attending the college, high school and college GPA, educational background, and academic goals.

Epistemic Beliefs Inventory (EBI)

All students in the chosen class, as well as the instructor, completed the EBI to assess their epistemological beliefs (Appendix A). In addition, other faculty members chosen also completed the EBI. The EBI was created by Schraw, et al. (1995) and was based on Schommer's (1990) five factor theory. The EBI (Schraw, et al., 1995) is designed to measure the respondents' beliefs about:

(1) certain knowledge (CK), (i.e. absolute knowledge exists and will eventually be known), (2) simple knowledge (SK), (i.e. knowledge consists of discrete facts) (3) omniscient authority (OA), (i.e. authorities have access to otherwise inaccessible knowledge, (3) quick

learning (QL), (i.e. learning occurs in a quick or not-at-all fashion), and (5) fixed ability (FA), (i.e. the ability to acquire knowledge is fixed) (p. 525).

The higher the score on each scale of the inventory, the stronger the participant's belief in that particular facet of knowledge. The highest possible score on each of the scales is as follows: QL= (25), FA= (35), SK= (35), CK= (40), and OA = (25).

In its development, the EBI was analyzed with a varimax rotation principal factor analysis (Schraw, et al., 1995). None of the factors were correlated above the .30 level. The varimax solution yielded five factors with eigenvalues greater than 1 and explained 64 percent of the total sample variation. The authors further stated that inspection of these factors revealed that they met the operational definitions for each of the five factors described by Schommer (1990, 1994a). This instrument contains 32 items. Participants respond on a 5-point Likert scale which ranges from "strongly disagree (1)" to "strongly agree (5)." This inventory was chosen due to its brevity in comparison to Schommer's (1990) EQ, and it yielded higher predictive validity and test-retest reliability than the EQ in a comparison study (Schraw, Bendixen &Dunkle, 2002). Duell and Schommer-Aikins (2001) stated Cronbach Alphas for items within each factor range from .63 to .87.

Computation of Epistemological Difference Score

After determining the scores on the five dimensions of epistemology as measure by the EBI, epistemological difference scores were computed. Specifically, the deviation between student and faculty scores across all five categories were calculated. These sums of the deviation scores are considered epistemological difference (ED) scores.

Interviews with Students

Eight students were chosen to participate according to their ED scores: four students with the highest ED scores and four students with the lowest ED scores. Interviews with student participants occurred on two occasions, February and April of a Spring semester. Students were contacted either via email or phone conversation. The experiences of the participating students were acquired primarily through these interviews. Patton (2002) states that the purpose of interviewing "is to allow us to enter into the other person's perspective" (p.341). The author further notes that there are three interview approaches: (1) the informal conversational interview; (2) the general interview guide approach; and (3) the standardized open-ended interview. According to Patton:

> The interview guide provides topics or subject areas within which the interviewer is free to explore, probe, and ask questions that will elucidate and illuminate that particular subject. Thus, the interviewer remains free to build a conversation within a particular subject area, to word questions spontaneously, and to establish a conversational style but with a focus on a particular subject that has been predetermined. (p. 343)

The first set of interviews was conducted according to the interview guide approach to ensure that all subject areas were covered with all participants while still allowing for the pursuit of greater depth in some areas (Patton, 2002). My interview protocol focused on the five theoretical areas articulated by Schommer (1990, 1994a) (see Appendix E). In addition, some questions focused on the students' impressions of the instructor and whether or not the student would remain in school if all classes were like the one in question. The students were asked about incidences when they felt either in or out of sync with the instructor. The students also answered these same questions for their chosen second faculty member they selected as having

an important impact (positive or negative) in their educational experiences. These interviews ranged from 25 to 60 minutes. They took place in empty offices in the student services area. Several of the interviews also occurred in an empty testing room also located in student services. All interviews were tape recorded and transcribed.

Toward the end of the semester in April, when students had more time to interact with faculty and their courses, a second interview occurred. This interview focused on questions related to academic integration and was based on Pascarella and Terenzini's (1980) instrument designed to measure academic integration (Appendix F). Questions were taken from the scales of interactions with faculty, faculty concern for student development and teaching, and academic and intellectual development. The alpha reliabilities for these scales are .83, .82 and .74, respectively (Pascarella & Terenzini, 1980). Students were asked about their academic and intellectual development, their strengths and weaknesses in each of their courses, their interactions with faculty, their feelings of being a part of the institution, and their intentions to continue with their coursework. This interview also followed the interview guide approach. The second interviews took place in the same locations and took approximately 25 to 40 minutes.

Interviews with Faculty

The instructor of the initial liberal arts course and seven other instructors were interviewed. Of the eight participants, two students chose the same instructor as their second teacher. Initial plans were to ask the students about the second faculty member during the second interview. It became apparent that it would take time to contact these individuals; therefore, students were asked during the first interview. Faculty were asked the same questions students were asked about their epistemological belief system. They were also asked if they believed their epistemological beliefs to be related to various classroom practices or teaching styles. These

interviews followed the interview guide approach (Appendix G). All interviews were audio taped and transcribed. These interviews took place in faculty members' offices or in empty classrooms. These interviews ranged from forty to 85 minutes.

Observations

Creswell (2002) defined observation as the process of "gathering first-hand information by observing people and places at a research site" (p. 199). Students were observed on two occasions; within the liberal arts course and their chosen course. My role was that of a non-participant observer in that I did not become involved with activities in the classroom but sat in a desk and watched and recorded the activities (Creswell, 2002). Activities in the classroom were recorded via an observational protocol. This protocol included three columns which include instructor activities, student activities and my own reflective notes (see Appendix H). I observed the initial liberal arts class and the other student selected courses. Students were told that I was observing the classroom to further my understanding of what we discussed in our interviews and about faculty and student interactions. Instructors were also informed that observations were to watch student and faculty interactions. Students were asked not to approach me in the classroom or hallways, thereby maintaining their confidentiality.

Field Notes

Field notes were recorded to capture nonverbal behaviors and provide for further description during interviews and observations of students in class. Bogdan and Biklen (1998) defined field notes as "the written account of what the researcher hears, sees, experiences, and thinks in the course of collecting and reflecting on the data in a qualitative study" (p. 108). They also proposed that field notes include descriptive and reflective material. During interviews, I took descriptive field notes and included the following areas as recommended by Bogdan and Biklen

(1998): (1) descriptions of the participants to include physical appearance, mannerisms and style of talking and acting; (2) depictions of activities to include descriptions of behavior and particular acts and (3) observer's behavior to include my assumptions or behavior and whatever else might affect the data that are gathered and analyzed.

Reflective field notes "contain sentences and paragraphs that reflect a more personal account of the course of the inquiry" (Bogdan & Biklen, 1998, p. 123). Bogdan and Biklen (1998) suggest that these types of notes reflect the more subjective side of the inquiry and might include speculation, feelings, problems, ideas, hunches, impressions, and prejudices. These notes were recorded after interviews and during observations and used in the analysis to recall descriptive student information.

Summary of Activities

All students and an instructor in an introductory liberal arts course completed the EBI. epistemological difference Scores for the instructor and students were calculated. Based on epistemological difference scores, eight students (4 with the highest ED scores and 4 with the lowest ED scores) were chosen to complete the case study design. Faculty interviews focused on the epistemological beliefs of the faculty members and how they envisioned their beliefs to be related to their classroom practices to include teaching style, assignments and methods of assessment.

Interviews were completed with the eight students on two occasions. The first interview was completed following the initial EBI administration and focused on their epistemological beliefs. During this interview, students were asked about other instructors whom they either felt in sync with or out of sync with. Each student provided the name of one instructor. The faculty who were recommended by the students also completed the EBI and interviews. Their classrooms

were observed. Therefore, I attempted to observe all students on two occasions (initial English course and subsequent student recommended course).

Data Analysis

Data for this study were first analyzed for each case followed by cross case analyses which allowed for themes to emerge from the data.

Case Studies

Transcribed student and faculty interviews, observations, and field notes from interviews were analyzed according to a contextual or holistic strategy to create each student case. Contextualizing strategies refer to those techniques that attempt to understand the narrative data in the context of a coherent whole "text" that includes interconnections among statements, acts, events, and outcomes. These techniques involve looking for patterns across the interconnecting narratives. Contextualized data are understood based on contiguous information rather than categorizing data and are based on iterative reading of the data. Data were analyzed according to Yin's (2003) strategy of relying on theoretical propositions. Yin (2003) states that this strategy is based on the theoretical propositions that led to the research questions, reviews of the literature, design, and original objectives of the study. Data were coded into the following areas and presented for each case: background of the student, relevant classroom experiences, interactions with faculty, grades, academic integration, and persistence.

Cross Case Analysis

Transcribed interviews, observations, and field notes were analyzed to find similarities and differences among cases, important constructs, and emerging themes. After considering each case separately, cases were compared for further description and thematic development

(Creswell, 2002). Data were analyzed according to the constant comparative method (Glaser & Strauss, 1967). According to Tashakkori and Teddlie (1996):

> This analytical scheme involves two general processes: a) unitizing, or breaking the text into units of information that will serve as the basis for defining categories, and (b) categorizing, or bringing together into provisional categories those units that relate to the same content, devising rules that describe category properties, and rendering each category set internally consistent and the entire set mutually exclusive. (p. 123)

Constant comparative analyses continued until categories were saturated. Categories for the themes in the cross case analyses included: epistemological congruency and students' classroom experience, epistemological congruency and grades, epistemological congruency and academic integration, and epistemological congruency and persistence. These categories were results of data analysis for each individual case. Then, data (student and faculty interviews, fieldnotes, and observations) from each case, within the various categories listed above, were coded using the following new categories: faculty student interaction, student perceptions of instruction, persistence, grades, teachers' perceptions of instruction, teacher characteristics, course characteristics, and teachers' thoughts on instruction/learning. Themes emerged within these categories and the focus was on connecting categories and emerging theory. These findings are presented in chapter 5.

Trustworthiness

Trustworthiness is a concept introduced by Lincoln and Guba (1985) and used by qualitative researchers as a means of establishing quality of the data as well as inferences they make about their data. Lincoln and Guba (1985) outlined four criteria to determine the trustworthiness of a study. These criteria are credibility, transferability, dependability and confirmability.

Credibility

Patton (2002) stated credibility of qualitative inquiry depends on three inquiry elements:

> (1) rigorous methods for doing fieldwork that yield high-quality data that are systematically analyzed with attention to issues of credibility; (2) credibility of the researcher, which is dependent on training, experience, track record, status and presentation of self; and (3) philosophical belief in the value of qualitative inquiry, that is, a fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling and holistic thinking. (p. 552-553)

In this study, rigorous methods for data collection included observations, interviews and administration of inventories were completed. Results of the quantitative measures (EBI and demographics form) were evaluated and compared with the narrative data (interviews and fieldnotes) collected. Triangulation of methods was completed to "check out the consistency of findings generated by different data collection methods" (Patton, 2002, p. 556). When reviewing interviews about epistemological beliefs and EBI data, I found that there were occasions that the interview data did not provide as specific information as the EBI. For example, when discussing whether knowledge changes or stays the same, some students had difficulty articulating their responses. They might have believed knowledge changed but had difficulty articulating how they felt it changed. It was helpful to review their EBI answers to gain further information and compare responses. In the data, I did not note any occasions where students responses were discrepant; in other words, the data worked in a complementary fashion.

In data analysis, I considered alternative themes, divergent patterns, and rival explanations for findings (Patton, 2002). I made notes of these possible other explanations or themes to assist me in formulating future research recommendations. During data collection and analysis, I took into

account any biases or predispositions I had toward the findings of my inquiry. Patton (2002) suggested discussing one's predispositions and making biases explicit. My detailed reflective fieldnotes brought any biases or subjective thoughts to the foreground (Bogdan & Biklen, 1998).

After reviewing my field notes, I noted that I was somewhat surprised to see that some students had similar or lower EBI scores as compared to their instructors. For example, I must have held the assumption that instructors' scores would be more sophisticated. Noting this information and reviewing it before the data analysis assisted me in not making inferences or conclusions based on my assumptions. In addition, some of the students' and faculty members' experiences reminded me of incidences from my undergraduate experiences. Particularly, the interviews of the students who sat on the periphery, mostly silent, evoked memories of my struggles as a student regarding class participation. In my experiences, I wanted to participate but felt that I had nothing to add. I theorized the causes for my silence and wondered if my participants held the same experiences. I enlisted the assistance of a peer with no stake in this research to review transcripts to review my themes to ensure the experiences of my participants were portrayed and not my own.

An additional method I used to establish credibility was member checking. Transcripts were sent to participants for their review and addition of information or further comments. One transcript was not sent to a particular instructor as he was not returning the next semester and he left no forwarding contact information. No students or instructors changed or added information to their transcripts.

Transferability

Transferability refers to the generalizability of conclusions or inferences to other settings (Taskakkori & Teddlie, 1998). Through the technique of thick description, my case study

research brought the cases to life in a way that is not possible using the statistical methods of quantitative research (Gall, Borg & Gall, 1996). Thick description requires rich, detailed and concrete descriptions of all information of the setting of the study so that readers can understand the phenomenon studied and draw their own interpretations about meaning and significance (Patton, 2002).

Dependability

Lincoln and Guba (1985) consider dependability as a substitute criterion for the quantitative concept of reliability. In other words, how consistent or reliable are the data collection methods and findings of the qualitative inquiry. To assess dependability, the researcher must take into account "both factors of instability and factors of phenomenal or design induced change" (Lincoln & Guba, p. 299). A dependability audit serves as a means to ensure dependability and includes the process of the inquiry, appropriateness of inquiry decisions and methodological shifts (Lincoln & Guba, 1985; Tashakkori & Teddlie, 1998). To ensure dependability in my study, multiple data gathering procedures included interviews, observations, and inventory results were used.

Confirmability

Confirmability is an aspect of trustworthiness concerned with the characteristics of the data and not the researcher (Lincoln & Guba, 1985). Confirmability has been defined as "the extent to which the data and interpretations of the study are grounded in events rather than the inquirer's personal construction" (Lincoln & Guba, 1985, p. 324). To provide confirmability in my study, I was mindful of the importance of being reflexive and considering my own cultural, political, social, linguistic, and ideological origins of my perspectives and voice as well as the perspectives and voices of those I interviewed (Patton, 2002). I noted feelings that emerged

about my undergraduate experiences and prior teaching experiences. I reviewed transcripts, observations, and fieldnotes on several occasions as well as my notes to help ensure that my interpretations of students' and instructors' experiences were reflections of their words and not my own. Data and method triangulation, as mentioned earlier, also added to the confirmability of the qualitative inquiry and findings (Lincoln & Guba, 1985).

Data Presentation

In the next chapter, each student case study is presented separately and is designated by the student's pseudonyms. Each case study will be presented according to a similar structure, consisting of relevant background information followed by information addressing the overarching research question of how students' experiences are affected by their levels of epistemological congruency and each of the three sub-research questions. Students' grades in selected courses, levels of academic integration, and intentions to persist were addressed in the narrative. Based on cross case analyses, themes emerged and are presented in chapter 5. Additionally, results of inferential statistics, which include Pearson Product Moment correlation coefficients for the relationships among: five epistemological dimensions and student grades, epistemological difference (ED) scores and grades, and EBI scores and grades, are presented in chapter 5. Finally, chapter 5 includes discussion, recommendations, and conclusions based on the data.

CHAPTER 4

FINDINGS

This study explored how epistemological congruency between student and teacher may or may not be related to their grades, academic integration and persistence. To begin this study, permission was obtained from an instructor who teaches a freshmen level, required liberal arts course to administer the Epistemic Beliefs Inventory (EBI) during one of his classes. On the day of the testing, 17 of the enrolled 22 students were present.

This chapter outlines the findings of the EBI administration and subsequent interviews with students and instructors. Epistemological congruency (EC) describes the congruency between students' and faculty members' epistemological beliefs. After determining the scores on the five dimensions of epistemology as measure by the EBI, epistemological difference scores were computed. Specifically, the deviation between student and faculty scores across all five categories were calculated. These sums of the deviation scores are considered epistemological difference (ED) scores.

Descriptive Statistics

Descriptive statistics of the EBI scores of the eight chosen students and selected instructors are outlined in Tables 1 and 2 to include means, standard deviations, and ranges of scores from each dimension as well as total score.

Table 1

EBI Dimensions and Total Scores for Students (N=8)

Score	*M*	*SD*	Range
Simple Knowledge	21.13	6.03	18
Certainty of Knowledge	17.13	5.19	16

(Table continued)

Quick Learning	8.88	1.73	4
Fixed Ability	19.38	3.34	10
Omniscient Authority	16.75	3.15	10
Total EBI Score	83.25	15.48	47

Table 2

EBI Dimensions and Total Scores for Instructors (N=8)

Score	*M*	*SD*	Range
Simple Knowledge	20.50	2.44	8
Certainty of Knowledge	16.63	2.13	7
Quick Learning	9.00	1.77	4
Fixed Ability	19.75	4.43	14
Omniscient Authority	15.63	2.62	7
Total EBI Score	81.50	9.28	25

Based on the above descriptive statistics, the students' scores displayed more variability. Specifically, the students' ranges for each dimension as well as total EBI scores are larger overall than the instructors' scores, possibly due to developmental issues of the students. In regard to the larger spread in other areas among students, Schommer-Aikins (2002) contends that "as learners continue to develop, individual beliefs may begin to merge, blur, and finally combine symbiotically, or in the case of the confused or anxious individual, combine in discord" (p. 110).

Their scores may have greater differences due to their recent academic experiences and exposure to new ideas. There was one exception, however, in the area of Fixed Ability. Instructors' range of scores for the dimension of fixed ability was more variable. One of the instructors had a higher score (29) in this dimension as compared to the other instructors, which likely accounts for a greater spread. He obtained the highest score in this area among students and instructors.

The student participants' experiences are discussed below. First, students with higher congruency with Mr. Henricksen (as evidenced by lower ED scores) will be presented followed by the students with lower congruency (as evidenced by higher ED scores).

High Epistemological Congruency with Liberal Arts instructor, Mr. Henricksen

Victor

Victor was a 19-year-old male with an ED score of 4, which was the most congruent score between a student and Mr. Henricksen. For one year prior to attending the community college, he attended a private institution. At the time of the interview, he was in his second semester at the community college and reported his GPA in the range of 2.51 to 3.0. His parents both possess bachelor's degrees. His future goal was to transfer to a four year institution after raising his current GPA. Victor was articulate, enthusiastic, and was forthcoming with his thoughts and experiences. The EBI dimensions for Victor and his instructors are presented in Figure 1.

Epistemological Beliefs and Classroom Experience. Victor reported that he liked his liberal arts instructor, Mr. Henricksen, but one has to "get accustomed to his teaching method." He went on to indicate that "he really makes you actually think of the answer." While he enjoyed the course, he also stated that he would not want all of his teachers to use the same methods. For instance, Victor relayed that the instructor's teaching methods were fine for a liberal arts course; however, when he asks a Math instructor "how to do a problem, I want her to tell me exactly

how to do a problem." According to Victor, the liberal arts course was his worst subject (ability wise), but he was able to persevere because he felt fairly in sync with this instructor and understands the assignments and his teaching style.

EBI Dimensions	Victor	Mr. Henricksen	Mr. Millsap
Fixed ability	20	19	29
Simplicity of knowledge	20	20	23
Omniscient authority	16	15	18
Quick learning	11	11	11
Certainty of knowledge	18	16	15
ED Score		4	17

Figure 1. Victor's ED scores across EBI dimensions.

The student reported that some people may be aggravated by the liberal arts instructor's method of challenging his students, but he has fun with it. He claimed that this teacher challenges them more and "makes us think about it." Victor's assessment of his instructor is validated by the instructor's reported belief that one can get a "point across better in more subtle ways." Mr. Henricksen stated that students need to involve themselves in their learning because he thinks "they get it better if they're working at it, working through it." He also acknowledged that some students become frustrated likely because they come in with the desire to obtain the answer quickly, obtain their credit and move on. In addition, Victor and Mr. Henricksen shared similar beliefs that knowledge was always changing and that knowledge in different disciplines is highly interwoven. Their most similar scores were in the areas of Simplicity of Knowledge and Quick Learning with both having scores of 20 and 11.

On the other hand, Victor felt fairly out of sync with one of his natural sciences instructors, Mr. Millsap. Victor's ED score with this particular instructor was a 17. Victor claimed that this

instructor puts emphasis "on stuff that's not really important." Victor reportedly relied more on the book for information and his learning in this subject. He reported that he took this course to bring up his GPA and believed that he has as much knowledge as the instructor regarding the particular subject. Victor and Mr. Millsap' largest discrepancy existed in the belief dimension of fixed ability with Mr. Winter's obtaining a total score of 29 and Victor obtaining a 20. This score indicates that Mr. Millsap has a stronger belief than Victor in an individual's ability to learn to be somewhat fixed. Recall that higher scores on the EBI indicate a stronger belief in that dimension. Yet, during an interview, Mr. Millsap reported that he believed that people can improve their learning ability over time and that it is important to study a topic over time for improvement. According to his score and interview response, it appeared Victor believed less than Mr. Millsap in fixed ability. Victor provided an example of how he improved his Calculus ability over time to explain his belief. He went from failing the course high school to making a high "B" in the course during college by devoting more study time to this subject.

Observations. Observations of Mr. Henricksen's class reiterated Victor's report of enjoying his liberal arts course. Victor actively participated in a group project and joked with his instructor. The instructor frequently walked around the classroom visiting various groups and commenting on students' work. The day I visited Mr. Millsap' class, Victor did not attend. He later told me that there was no need to because all of his work was done and his grade was not affected.

Grades. According to Victor, his final grades were reported to be a "B" in his liberal arts course and an "A" in his sciences course.

Persistence. Victor reportedly struggled his first year of college due to increased social activities, and he "started skipping class." Victor stated that he would stay in school regardless

of what type of teachers he encounters. He reported "as far as staying in school, I don't really have a choice…I don't want to go through life struggling. I don't want to quit and go to work at a gas station the rest of my life."

Academic Integration. Victor reported getting along with all of his teachers. He reported being able to communicate easier with female instructors and felt more comfortable talking to them regarding out of class issues or topics not related to the class assignment. He stated, "We just shoot the breeze for a little while." Most of his relationships with faculty consisted of talking in class, and he reported not seeking them outside of class for anything. He acknowledged that the opportunity for more interaction is offered (phone numbers, email, office hours); however, he reported he has not found the need to initiate that interaction. He also did not feel that his relationships with faculty have influenced his personal growth, values, or attitudes. He reported that he is "just in the classes…to get a credit and get my GPA up."

As stated by Victor, he felt that the liberal arts instructor had a good attitude about teaching and was somewhat interested in his intellectual growth. For example, he again reported feeling challenged by the instructor to think for himself and figure out solutions to problems. On the other hand, he did not feel the same challenge from his natural science instructor. Overall, he reported that his academic experiences have done little to influence his academic growth or interest in ideas and intellectual matters.

Analysis. It appeared that Victor's ED scores seemed to be related to how well he liked his courses and his instructors. Victor's ED score of 4 with Mr. Henricksen was the lowest of all students. He reported feeling in sync with Mr. Henricksen as well as somewhat challenged in the course to be involved in his own learning. On the contrary, he did not feel in sync with Mr. Millsap and his ED score was higher 17. His ED scores did not seem to be highly related to his

grades or to his reported plans to persist. Victor stated that he planned to stay in school no matter what the situation; however, it should be noted that many students report the same plans yet leave institutions. Victor's attitude about persisting could be due to his past struggles at the university level. He had to leave a four year institution due to low grades.

In regard to academic integration, Victor seemed to be somewhat integrated in that he reported talking to several of his instructors, asking questions, and not being afraid to approach his instructors. He seemed to have more interaction with Mr. Henricksen and really did not want to interact as much with Mr. Millsap. In fact, he only went to class when necessary for his grade. EC seemed to have played some role in his desire to integrate into the academic realm. Across the five dimensions, Victor and Mr. Williams had very similar scores with the largest discrepancy being two points in the area of certainty of knowledge. On the contrary, Victor and Mr. Millsap had a larger discrepancy in the area of fixed ability. It could be that Mr. Winter's stronger belief in the relatedness of an individual's innate ability and his or her academic success informed his style of teaching. Since Victor did not have as strong of a belief in this area, perhaps he did not feel in sync with this instructor.

Allen

Allen was a 21-year-old male student with five semesters of prior college experience at two universities. He was a pleasant, soft-spoken student who seemed eager to help with this study. His ED score with Mr. Henricksen was 10. This semester was his first at Cypress College. He reported his college GPA to be in the range of 2.0 to 2.25. His future goal was to transfer the following semester to a university as he wanted to bring up his grades previously earned at the universities. He indicated that he struggled academically at two other four-year institutions in the state prior to enrolling at Cypress College. He reported that his father has obtained a doctoral

degree, and his mother has a bachelor's degree and attended graduate school. The EBI dimensions for Allen and his instructors are presented in Figure 2.

EBI Dimensions	Allen	Mr. Henricksen	Ms. Stein
Fixed Ability	19	19	16
Simplicity of Knowledge	15	20	16
Omniscient Authority	15	15	17
Quick Learning	7	11	7
Certainty of Knowledge	15	16	18
ED Score		10	9

Figure 2. Allen's ED scores across EBI dimensions.

Epistemological Beliefs and Classroom Experience. Allen stated that Mr. Henricksen "is refreshing…he's not monotonous…he keeps my attention." He finds Mr. Henricksen to be "very helpful and with like communication…and pointing me in the right direction." Allen has visited the instructor during office hours and found it to be helpful to his understanding. He felt particularly in sync with the instructor at the beginning of the semester when Mr. Henricksen assisted him in finding the information he needed to begin his first essay. This student and Mr. Henricksen held similar beliefs on the five epistemological dimensions with the largest difference of 5 being in the dimension of simplicity of knowledge. Allen reported that he really has not felt out of sync with his instructor yet this semester. On the other hand, he claimed to feel out of sync with his another instructor, Ms. Stein, who also teaches a liberal arts course. His ED score with Ms. Stein is a 9.

When asked about feeling out of sync, Allen mentioned not feeling as if the instructor wanted to help him when he asks questions. He wanted more feedback and more interaction with the

instructor. At the same time, he did acknowledge that the instructor provides informative lectures and field study. Despite feeling out of sync with Ms. Stein, Allen's beliefs in knowledge and learning were very similar to hers. The largest discrepancies, which were only 3 point differences, occurred in the dimensions of certainty of knowledge and fixed ability. Their most similar score was in the area of quick learning with both obtaining scores of 7. Allen and Mr. Henricksen had a 5-point and a 4-point discrepancy in the areas of simplicity and certainty of knowledge, respectively. They obtained the same scores (15 and 19) in the areas of fixed ability and omniscient authority.

Interestingly, on two occasions during our interview, Ms. Stein mentioned the need for teachers to provide extra assistance to students who were trying and in need of extra attention. She described her role as a community college instructor to provide more "one-on-one assistance." She also relayed that she requires students to answer questions on her tests in complete and grammatically correct sentences; therefore, she has to put her "money where her mouth is" and take the extra time to grade the assignments. This instructor relayed the importance of teaching students to think for themselves and not tell them what they should think. This philosophy was similar to Mr. Henricksen's belief that he wants students to become involved in their learning so he may be a little indirect. He further noted that he has learned over his years of teaching experience that instructors have to listen to the questions students are asking and then gauge how far they can go with the push to help students find the answers to their questions.

Observations. Based on class observations, Allen seemed to be more involved in Mr. Henricksen's class and more at ease. He sat in the front of the classroom and answered the instructor's questions and gave affirming nods to the instructor's directions. In his second

liberal arts course, Allen arrived thirty minutes late and missed a pop quiz. Upon his arrival, other students relayed to him what he missed and what page they were on. Throughout the class time, the student did not volunteer information unless asked by the instructor.

Persistence. He reported that if every class were like Mr. Henricksen's it would be likely that he would stay in school at which time he specifically mentioned the use of computers during class as a key feature. He stated that he likes the technology aspect (using a projector to enhance lectures) of his second liberal arts course but he would not be likely to remain in school if all courses were like this one as he appears to be affected by his feeling of a lack of a student-teacher interaction.

Grades. Allen reported receiving a grade of "B" in both of his courses.

Academic Integration. Allen expressed a desire to have some type of interactions with his instructors related to academic concerns. He reported having the most interaction with Mr. Henricksen in the form of emails, office hours and in-class assistance. Allen reported the least amount of interaction with Ms. Stein. He noted seeing signs for tutoring and other academic workshops around the campus; however, he had not utilized these services due to his feeling that he did not need them. In describing his instructors' attitudes about students' intellectual growth and well being, Allen reported that he did not really feel a significant amount of concern about his academic career from his instructors. He stated that, "I don't even hear them say, like, this will help in the future, or this will make you a better person, or anything." On the other hand, he acknowledged some of his instructors' enthusiasm for teaching and for their subject matter. He judged his teachers' passion by "the tone of their voice…the emphasis they make. You see them get excited about stuff." He reported feeling this enthusiasm in Mr. Henricksen's course. He

feels this instructor displays an interest in his students' success. Allen stated that this interest "definitely" makes him want to go to that class more often.

Overall, Allen stated that all of his classes are academically stimulating and that his academic experiences have influenced his academic growth or interest in ideas and intellectual knowledge. According to Allen, throughout the semester, he developed an appreciation of learning for its own sake rather than taking courses only for degree completion. "Now I see where everything, every class that I take will benefit me and my future," stated Allen. This development reportedly occurred in part due to faculty interactions and the stimulating content of courses this semester.

Analysis. Allen's ED score with Ms. Stein was one point lower than his score with Mr. Henricksen indicating only a very small difference. However, both of his ED scores, as compared to other students', were relatively low and indicated higher epistemological congruency. His ED scores did not seem to be related to grades since he received a "B" in both courses. In regard to persistence, his congruency levels likely did not contribute to Allen's intentions to persist. Allen stated that he would not likely persist if all classes were like Ms. Stein', and his EC score with her was similar to his score with Mr. Henricksen.

Allen and Mr. Henricksen both obtained the same scores in the areas of fixed ability and omniscient authority while Allen and Ms. Stein scores in the area of fixed ability and certainty of knowledge were not similar. Although not large differences, perhaps these particular beliefs were translated by Ms. Stein into classroom practices that were not in sync with Allen's learning strategies.

Over the semester, Allen seemed to become fairly integrated into the academic community. He reported that his classes were intellectually stimulating, and his relationships with faculty heightened his interest in learning for its own sake. It should be noted that Allen's ED scores

with both instructors were fairly low which could be important to his overall academic experience. Despite teaching style or personality of the instructor, the comparable belief system of instructor and student may have had an impact on this student's learning experience.

Becky

Becky's ED score with Mr. Henricksen was a 10. She was a 19-year-old student in her second semester at Cypress College with no other college experience. She planned to attend the community college next semester but eventually plans to transfer to a four-year institution. Her reported high school GPA and current college GPA are both in the range 2.51 and 3.0. Her father reportedly obtained earned an associate's degree and her mother completed high school. Becky chose the community college for the reasons of affordability, smaller class size, a smaller campus, and an open admissions policy. Becky was enthusiastic about participating while she also seemed to be very busy. She reported that she worked approximately thirty hours a week and had outside interests and hobbies that kept her schedule fairly hectic. She seemed to be a somewhat confident young woman who is able to verbalize her opinions. Becky's EBI dimensions are presented in Figure 3.

EBI Dimensions	Becky	Mr. Henricksen	Mr. Barett
Fixed Ability	17	19	19
Simplicity of Knowledge	21	20	21
Omniscient Authority	14	15	13
Quick Learning	11	11	7
Certainty of Knowledge	10	16	16
ED Score		10	13

Figure 3. Becky's ED scores across EBI dimensions.

Epistemological Beliefs and Classroom Experience. Becky reported having a difficult time in her liberal arts course due to the instructor speaking at a fast rate and in a low tone. On the other hand, she reported that Mr. Henricksen's teaching skills were fine and that it was really other issues that she did not find so helpful in the course. For example, there were occasions when Becky did not feel in sync with this instructor usually in regard to assignments because she "wishes the assignments were different." She expressed her opinion that some of them were not very meaningful to her. At the same time, she felt in sync with the instructor in regard to his provision of handouts and written assignments. Becky appreciated having something tangible to follow rather than lecture or verbal instructions only. She reported that she does not like having to "guess and guess and guess until we answer our own question." Becky stated that she prefers a more direct answer to questions than what she reported to be Mr. Henricksen's style. On this same topic, Mr. Henricksen noted, "You get it directly, you get it fast, but does it stay with you?" He wants his students to become involved in their learning, problem solve and think critically.

While most of her scores were similar to Mr. Henricksen's, their largest discrepancy was in the area of certainty of knowledge. Both Mr. Henricksen and Becky expressed the view that knowledge was always changing, with their scores being 16 and 10, respectively. In regard to the question related to the changeability of knowledge, Becky stated, "Most of it is definitely changing." Similarly, Mr. Henricksen reported that he believed knowledge was changing; however, his belief about the changeability of knowledge was derived not only from his belief of new discoveries but also belief of one's involvement in this process. He stated, "You just keep adding impressions that combine with each other and so, of course, it's changing, with more complex ideas and more complex…And then ideas combine with ideas in the brain [and this process leads to] more complex ideas." Their most congruent belief was in the area of quick

learning with both respondents obtaining a score of 11. Their scores indicate that both leaned toward the belief that one can improve their learning ability with practice over time.

While Becky felt somewhat in sync with Mr. Henricksen, she reported feeling highly in sync with another liberal arts instructor, Mr. Barett. She stated, "He really explains everything." She also stated, "He's down to earth with everyone, which is really great." Becky went on to explain that Mr. Barett is very available to assist students not only in class but also outside of class. She noted that she felts in sync with Mr. Barett "pretty much most of the time I go." She only felt out of sync if she missed a class and had to catch up indicating it is likely that the out of sync feeling was derived from her absence and not from the instructor.

Her ED score with Mr. Barett is a 13 which compared to her EC score of a 10 with Mr. Henricksen is more of a discrepancy. The largest discrepancy between Mr. Barett and Becky was the dimension of certainty of knowledge with their scores being 16 and 10, respectively. Mr. Henricksen and Mr. Barett's scores in this area were the same. In regard to this belief, Mr. Barett acknowledged that some things "are constant throughout history," while he also acknowledged the individual's role in this changeability of knowledge. He stated that "maybe the kind of way that we approach them, the way we study and the way that we go about looking at it changes. So it's kind of like our language changes, our destination changes, but the foundations are there." While Becky acknowledged things are always changing, she did not relay her belief that she has some role in how knowledge changes. Their most congruent belief was in the area of simplicity of knowledge both receiving scores of 21.

Mr. Barett relayed that he was a new instructor and has lately given some significant thought to teaching. He emphasized the importance of acknowledging that a teacher's beliefs and values may be dissimilar from those of his or her. Nevertheless, he feels there is "common ground you

can lean on that everybody kind of understands." Further, he noted that each student may get a different message or interpretation of what you try to teach but a teacher can get the same concept across by being flexible and understanding what each student needs. In addition to seeing his own role in the changeability of knowledge, he also saw himself as a constructor of knowledge using his experiences and outside sources such as books, the Internet, and teachers.

Observations. Observations of Becky in Mr. Henricksen's class indicated that she seemed involved with the activities and was attempting to get her work done. She talked with classmates and seemed to be engaged in the assignment. In Mr. Barett's class, Becky was highly engaged with the course activity and seemed to be working very diligently towards completion of their project. She interacted more frequently with Mr. Barett as the entire class worked on a particular project. It should be noted that Mr. Barett's course, by nature of the subject, requires a more "hands on" approach. It should also be noted that Mr. Barett's course is directly related to her intended major.

Persistence. Becky stated that if all classes were like Mr. Henricksen's there is about a "three-quarter" chance that she would stay in school. When asked the same question about Mr. Barett's course, Becky stated that it is very likely that she would stay in school.

Grades. Becky received a "C" in Mr. Henricksen's course and an "A" in Mr. Barett's course.

Academic Integration. Becky described the focus of her relationship with faculty to be centered around asking questions when she does not understand. When asked about how relationships with faculty have influenced her personal growth, values, or attitudes, she stated that in regard to many of her instructors, she sees their role as being similar to "bosses" at places of employment. Then she clarifies her comments and states that she really means she has learned to be respectful because she used to get in trouble for interrupting when she was

younger. When asked about instructors' attitudes toward teaching or students' personal growth and well-being, Becky felts that Mr. Henricksen is not highly interested in these areas. She again stated that she has difficulty communicating with him. On the other hand, she felt that Mr. Barett is highly interested in the students' academic well-being and teaching.

She based this opinion of Mr. Barett on his request for student input into future courses needed on campus as well as his current courses and projects. She reported having options available in his course. Becky relayed that she sees her other teachers as more "authority figures." According to Becky, her courses were intellectually stimulating, and Mr. Barett's course facilitated her thinking about a future career.

Analysis. Becky's ED scores with both of her instructors were fairly similar. She did not find Mr. Henricksen's teaching style to be as conducive to her learning as Mr. Barett's. She interpreted Mr. Henricksen's desire to spur students to become more involved in their learning by not answering some students' questions as frustrating. In Mr. Barett's class, she reported that students were able to voice opinions and make choices on projects and assignments, which she found more conducive to learning. Becky received a higher grade in Mr. Barett's class; yet, their ED score was 3 points higher than the score with Mr. Henricksen. It is interesting to note however, that both of her ED scores with the chosen faculty are relatively low meaning she obtained scores fairly similar to both instructors.

Becky's largest discrepancy with both instructors was in the areas of certainty of knowledge; the instructors both obtained the higher score of a 16 on this dimension as compared to Becky's score of 10. She was more similar to Mr. Barett in the area of simplicity of knowledge as they both received a score of 21. These results could mean the following: for this particular student,

the simplicity of knowledge dimension and how this particular faculty member translated this belief into practice is more meaningful than the other dimensions.

In regard to persistence, Becky claimed that she was returning for the next semester and would likely return if all courses were like Mr. Henricksen and would definitely return if all classes were like Mr. Barett's. Again, her lower overall ED scores may have some influence as to how she negotiates and interprets her academic experiences with these particular instructors. In regard to academic integration, Becky seemed fairly integrated into the academic community of her college, although she attributed most of this integration to Mr. Barett. Becky relayed that with the exception of Mr. Barett, she viewed her instructors as more authority figures while Mr. Barett appeared to ask more frequently for student input. She reported feeling comfortable offering her opinions about class assignments and projects with Mr. Barett while she did not feel that other instructors would welcome her comments.

Connie

Connie was a 23-year-old student in her second semester at Cypress College. She planned to obtain an associate's degree and then transfer to a four-year institution. This student had no other experience in higher education. Her self-reported, college GPA is in the range of 3.6 to 4.0 somewhat higher than her reported high school GPA of 2.51 to 3.0. In regard to parents' education, Connie indicated that her father obtained less than a high school diploma and her mother graduated from high school. Connie was pleasant but not as talkative as some of the other students. She described herself as "shy" and said she felt uneasy openly discussing her opinions. Despite her uneasy feeling, she was helpful and offered her experiences. Her ED score with Mr. Henricksen was a 12. The EBI dimensions for Connie and her instructors are presented in Figure 4.

EBI Dimensions	Connie	Mr. Henricksen	Ms. Smith
Fixed Ability	21	19	23
Simplicity of Knowledge	22	20	19
Omniscient Authority	19	15	20
Quick Learning	10	11	11
Certainty of Knowledge	19	16	21
ED Score		12	9

Figure 4. Connie's ED scores across EBI dimensions

Epistemological Beliefs and Classroom Experience. Connie reported that she found Mr. Henricksen to really be interested in the students' improvement of their academic skills. At the same time, she also expressed her view that there is too much work involved in the course. Connie also commented that there is not a lot of teaching involved and that it is not possible to get 100%. Most assignments are given in writing, and they work in groups or independently on them. She related that she sometimes feels in sync with the instructor; it just depends on the assignment. Connie also reported that she really does not like this particular subject so perhaps her opinion of the course is clouded by her dislike of the course material. She does not see the instructor during office hours for additional questions. If she has questions, she asks during class.

Connie and Mr. Henricksen did not have any large discrepancies across their epistemological beliefs. Their most congruent belief was in quick learning with Connie's score of 10 and Mr. Henricksen's score of an 11. Their largest difference was in the area of omniscient authority with Connie obtaining a 19 and Mr. Henricksen obtaining a 15.

During our meeting, Connie mentioned a course that she does not see as relevant to her education. It is a developmental skill building course in which she also did not feel in sync with this instructor and feels unchallenged by the work. Her ED score with this instructor is a 9 which is a smaller difference than with Mr. Henricksen. Across the five dimensions, Connie and Ms. Smith had only small differences. Their most similar scores were in the areas of quick learning and omniscient authority with only 1 point differences. In the area of simplicity of knowledge, their scores were the most dissimilar with Connie obtaining a 22 and Ms. Smith obtaining a 19.

Connie reported Ms. Smith to be an "OK" teacher. The student related that Ms. Smith readily answers questions but she found there is a lot of homework in this course and "if you don't do it then you're just pretty much quiet, you know?" Connie described that it was embarrassing not to have homework completed because it became obvious to everyone when a student was silent. During class when they go over their homework, students are expected to share their homework findings with the class. Connie reported not liking the required class participation whether she gets her homework done or not. She stated, "I'm shy. I don't like it. I like to know information ahead of time so I can get the right answer and be through with it. The faster I can quit talking is the best thing for me."

Ms. Smith acknowledged that she is aware some of her students do not complete their homework, which is why she says that she sometimes has to adjust what she does in the classroom. Her willingness to change teaching methods was related to her belief that knowledge is always changing, and there are new ways of introducing material. She reported that she is "constantly evaluating" strategies and teaching methods. Based on her teaching experiences, Ms. Smith asserted that students today do not want to do homework, and she was worried that they do not see the relevance of working on their own. She described students she knows who

are enrolled in too many courses and have too many outside responsibilities to get their work done. Ms. Smith also has found that students are coming to her course academically underprepared. When students do not understand, Ms. Smith related her desire for them to speak up and ask questions so she is aware that they are lost.

Observations. In observing Connie in Ms. Smith's class, it appeared that she was a little more engaged in the activity in this course. This engagement was likely due to Ms. Smith's requirement that each student participate and discuss the homework. The teacher and student laughed at a joke about an assignment and Connie seemed fairly at ease. In Mr. Henricksen's class, Connie was attentive to the work at hand and talked with another student but did not address Mr. Henricksen.

Grades. Connie reported obtaining a "C" in Mr. Henricksen's course and a "B" in Ms. Smith's course.

Persistence. The student reported that if all classes were like Mr. Henricksen's she states she "wouldn't make it" mainly due to the amount of work. However, she and some friends formed a study group and planned to help each other. When asked if all courses were like Ms. Smith's, Connie stated, "I would stay. Staying no matter what." Connie expressed her desire to finish school and seemed confident that she would continue. She reported having a good family support system that encouraged her to continue. She planned to return next semester.

Academic Integration. Connie described little interaction with her instructors besides asking questions in class. She stated that if she has "a question or anything, they'll answer it, pretty much anything. It's pretty good." She stated that Ms. Smith influenced her attitude and values in regard to school. In Connie's opinion, Ms. Smith's discussions about cramming for tests and not doing homework have helped her think about getting tasks done and not procrastinating. In

regard to her teachers' attitudes about teaching and their attitudes towards her intellectual growth and well-being, Connie believed that all of her instructors loved their jobs and were enthusiastic about their subject.

The student also viewed Ms. Smith somewhat differently at our second meeting. She felt that Ms. Smith really wanted to help students, and Connie seemed to see the important role her assignments played in her intellectual growth. When asked if her classes were boring, stimulating or somewhere in the middle, Connie reported that her classes were "somewhere in the middle." She claimed that her "nonchalant" attitude influences her thinking. She stated that "I'm so nonchalant, I have a no care attitude which I need to change."

Analysis. As the semester progressed, Connie became more interested in her education as evidenced by her realization that she procrastinated and her desire to be more serious about school. During our second interview, Connie expressed her new opinion of Ms. Smith. She liked this instructor and felt cared about in her class. The student seemed to be more in sync with Ms. Smith in comparison to Mr. Henricksen which corresponds to the lower ED score with Ms. Smith of 9 and 12, respectively. In regard to grades, Connie obtained a higher grade of "B" in Ms. Smith's class; therefore, epistemological congruency with Ms. Smith could have affected this students' classroom experience. When asked about returning next semester, Connie planned to stay in school "no matter what." Despite her overall intent to stay, she also noted that she would not be able to stay if all classes were like Mr. Henricksen's and would stay if all were like Ms. Smith's. Her lower EC score with Ms. Smith might have impacted her intentions to persist.

In the beginning of the semester, Connie did not feel in sync with Ms. Smith's class. When examining their largest discrepancy in the area of simplicity of knowledge, it is interesting to recall Connie's frustration when Ms. Smith used examples from other disciplines in her

teaching. Ms. Smith believed more in the complexity of knowledge and the interrelatedness across disciplines. Since Connie believed more in the simplicity of knowledge, her frustration with Ms. Smith for bringing in examples from other disciplines could have been derived from this discrepancy.

Connie became more integrated into the academic community toward the end of the semester. Although she noted very little interaction with instructors, Connie did not desire more interaction and seemed to get what she needed from her current level of interactions. She found Ms. Smith's class influential to her intellectual growth and attitudes and values toward school. Once again, her lower ED score with Ms. Smith could have contributed to Connie's integration into the academic system. It is also important to note that both of Connie's ED scores were relatively low (9 and 12) which could have impacted her educational experiences.

Low Epistemological Congruency with Liberal Arts instructor, Mr. Henricksen

Troy

Troy was a 25-year-old student with one prior semester of college from several years ago. He did not report his GPA from that first semester. This semester was his first at Cypress College, and he planned to attend the college next semester. He chose the community college for its smaller classers, smaller campus and open admissions policy at the institution. Eventually, Troy plans to transfer to a university after completing some courses at Cypress College. He also stated that he has worked in the medical field for several years and has gained a lot of knowledge through real life experiences. According to Troy, his father obtained less than a high school diploma his mother attended college but did not earn a degree. Troy seemed very interested in and enthusiastic about the study and was very forthcoming with his experiences. His ED score with Mr. Henricksen was a 23. The EBI dimensions for Troy and his instructors are in Figure 5.

EBI Dimensions	Troy	Mr. Henricksen	Mr. Farmer
Fixed Ability	14	19	18
Simplicity of Knowledge	11	20	20
Omniscient Authority	13	15	13
Quick Learning	7	11	8
Certainty of Knowledge	13	16	17
ED Score		23	18

Figure 5. Troy's ED scores across EBI dimensions.

Epistemological Beliefs and Classroom Experience. Troy reported that Mr. Henricksen was a very knowledgeable instructor who responded quickly to his questions out of class. He also found the course interesting and challenging. Troy stated, "He doesn't give me exactly what he wants…but he gives me some direction of what I should change." The student expressed a desire for Mr. Henricksen to "Tell me what's wrong…give me an example so that I can make myself better as a writer, because that's what I want to do." On reviewing the experiences of his semester, Troy sensed that he and Mr. Henricksen "misunderstood each other a lot during the semester." The student surmised that he could have done better on some of his work had he understood the directions better. Independent assignments and working on the computer were the satisfying aspects of the course. At the same time, Troy expressed frustration and feeling out of sync in the course because he had a large research assignment, and he is having difficulty narrowing his topic. He stated that although another student's topic is narrow and "mine is so broad, and he won't narrow it down. I guess he's leaving it up to me, but I'm really confused with the project."

Troy and Mr. Henricksen's largest discrepancies were in the areas of simplicity of knowledge and fixed ability. Troy's score of 11 and Mr. Henricksen's score of 20 on the simplicity of knowledge scale likely indicates that while Mr. Williams finds much of knowledge complex, he also believes that some forms of knowledge are more simplistic. In regard to fixed ability, the following words were evidence of Troy's firm belief that individuals have the capacity to improve their learning ability. Troy stated that "If it's interesting to me, and I don't understand and it just racks my brain. I'm going to make myself learn it some kind of way. Cause if I don't understand something at the beginning, I'm gonna make myself understand it." On the other hand, while Mr. Henricksen held the belief that individuals can improve their learning ability over time he also felt that there might be a limit at some point to what someone can learn due to many issues such as their educational background and choices an individual makes throughout his or her educational experiences and life.

When asked about an instructor he felt more in sync with, Troy suggested Mr. Farmer who teaches a social science course. His ED score with this instructor was an 18, which is lower score than his score with Mr. Henricksen, indicating more congruency with Mr. Farmer. Troy enjoyed this instructor's course because he gives them a study guide and offers discussions with real life examples. At the beginning of the semester, Troy stated he was often puzzled as to the point of the instructor's examples or comments in class. The student stated that he found that "if you think about it and you work on it, it really does make sense." He followed with the idea that he learned to pull information from the texts on his own in this instructor's course. He further noted, "His opinions and things that he challenges us to think about really have made me look at things a little bit differently." Troy mentioned politics and religion to be something that he has thought more about this semester but not necessarily due to his instructor's teaching.

The largest discrepancy between Troy and Mr. Farmer was in the area of simplicity of knowledge with their scores of 11 and 20, respectively. Their most similar score was in the area of omniscient authority with both obtaining scores of 13. Like Troy, Mr. Farmer related the importance of one's own role in knowledge construction. Mr. Farmer reported that his sources of knowledge include people, books, and his own experiences. He stated, "If you don't actively acquire the knowledge or information from it, then there's no jumping point for our understanding." This instructor also noted how learning can also be a fearful time for individuals because they may have to change and "that change is so scary that they'd rather remain the way they are than seek out something that might help them."

Mr. Farmer also saw knowledge as always changing. Again, his belief that an individual plays a role in their acquisition of knowledge was evidenced through his comment that:

> Knowledge has to change with each generation of scholars. They have to be able to make the knowledge their own, and they will bring their own background, socioeconomic background, education, religion, gender to bear on that knowledge and the expression of that knowledge to others.

In regard to the belief in the simplicity of knowledge, Mr. Farmer believed as did Troy that knowledge from different disciplines was part of a highly complex interwoven network. Although Mr. Farmer and Mr. Henricksen stated their belief in the complexity of knowledge, Mr. Farmer commented:

> I need to have a basic knowledge of the...connections between mathematics, philosophy, physics, chemistry, things of that nature to understand that these things are interrelated. If you don't have a history of how these things came about, just knowing them by themselves doesn't give you a more well-rounded or breadth or depth of perception or understanding.

Observations. In both courses, Troy seemed engaged in the classroom. During the observation in Mr. Henricksen's class, Troy frequently asked questions about the assignment and participated in the group activity. In Mr. Farmer's class, Troy was diligently taking notes and listening. There were no striking differences in the student's behavior in the different courses except that Troy was more silent in Mr. Farmer's class. This silence was perhaps due to the different purposes in these courses on that particular day. Mr. Farmer was reviewing for an exam while Mr. Henricksen's class worked on a group in-class assignment.

Grades. Troy reported that he received "A's" in both of his courses.

Persistence. Troy reported that he would stay in school regardless of what types of courses or instructors he encounters in his academic career. Troy reportedly has been in the work force for several years and desires to obtain a degree. He does not want to continue the type of work he doing and has found his work interests have somewhat changed.

Academic Integration. Troy shared that there were probably two instructors that he "can't even remember their names but I just go inside and do what I gotta do and leave." He described his relationships with faculty consisting of mainly asking questions in class. Troy further stated that he has not really needed to interact in a more meaningful way. He stated that if he was not doing well in a course, then he would "be bugging him like crazy. It just doesn't appeal to me. I mean I have enough relationships outside of school that I don't need extra relationships."

In regard to any influence on his personal growth, values, or attitudes by instructors or particular courses, Troy reported that Mr. Farmer's course had somewhat of an influence on his values and attitudes, also stating "It could be a combination of things…maybe just some material in class, not necessarily the teacher, that kind of changes the way you feel about something." He

attributed some of his changing views to be related to "just a change in my life, not necessarily the class, but it just kind of helped me."

In his description of his instructors' attitudes about teaching, students' intellectual growth, and well-being, Troy shared his belief that students have a responsibility in their own learning. He also stated that overall he knew he had some great teachers and that he has learned through applying himself this semester. Overall, he sensed that his teachers had good attitudes about teaching and students' learning. He found all of his courses to be fairly academically stimulating and still planned to attend Cypress College for one more semester and then transfer to a university.

Analysis. Troy seemed to enjoy Mr. Farmer's class and seemed to glean something out of his teaching. While he did not completely attribute the intellectual growth he experienced during the semester to Mr. Farmer, he mentioned his course as somewhat influential on his values and attitudes in regard to politics and religion. Troy received "A's" in both of his courses despite his ED scores with the two instructors. Interestingly, Troy received the lowest scores of all eight participants on four of the five EB dimensions of the EBI and obtained the lowest overall EBI score including students and teachers. The lower scores indicated more sophisticated beliefs in those areas. It is important to note that Schommer-Aikens (2004) cautions about balance being key in the definition of "epistemological sophistication" (p. 21). She provides the example of an extreme belief that knowledge is unchanging and how this might "render individuals dogmatic and unable to change when the situation demands change" (p. 21). On the other hand, extreme beliefs in tentative knowledge, "could render individuals unable to hold a particular point of view" (Schommer-Aikins, 2004, p. 21). Future research is recommended to determine what EBI scores might constitute sophisticated thinking.

Across the dimensions, Troy's ED scores with both instructors were the most discrepant in the areas of simplicity of knowledge and fixed ability. His most similar scores with Mr. Farmer were in omniscient authority and quick learning. For this particular student, perhaps these dimensions are key in shaping his academic experiences. Again, the manner in which the instructor's beliefs in these areas were translated into classroom practices or teaching style may have also played a vital role.

Troy's level of congruency did not appear to relate to his grades or persistence. He plans to return to Cypress College and continue at a university no matter what teachers or types of courses he encounters. Troy possessed the attitude that classroom experience and learning was what one made of it. This assessment is based on his comments regarding the integral role a student plays in his own learning. Yet, if one compares Troy's ED scores with instructors to each other, Troy's lower score with Mr. Farmer could have impacted his level of academic integration this semester. Mr. Farmer seemed to have more of an impact on this student's intellectual growth and thinking about intellectual matters.

Kellie

Kellie was an 18-year-old, second semester student at Cypress College. She planned to take a few courses at the college and then transfer to a university. She intended to return next semester. Her GPA at Cypress College was between a 2.26 and 2.50. According to Kellie, she chose the community college because of the smaller campus and the open admissions policy at this college. She indicated that both of her parents earned associate's degrees. Kellie had the lowest level of congruency with Mr. Henricksen, as indicated by an ED score of a 28. She was very cooperative, pleasant and interested in the study; however, Kellie seemed to be somewhat shy

and not as talkative as some of the other students. The EBI dimensions for Kellie and her instructors are presented in Figure 6.

EBI Dimensions	Kellie	Mr. Henricksen	Mr. Farmer
Fixed Ability	24	19	18
Simplicity of Knowledge	29	20	20
Omniscient Authority	17	15	13
Quick Learning	9	11	8
Certainty of Knowledge	26	16	17
ED Score		28	29

Figure 6. Kellie's ED scores across EBI dimensions.

Epistemological Beliefs and Classroom Experience. Kellie reported that Mr. Henricksen's class was too fast paced for her. She also stated that there is not enough instruction, and if she could drop that class she would. When speaking of the assignments, Kellie noted that she does not like to redo anything. She wanted to "get a grade" and be done with it as she has too much other work to do. Kellie also stated that she was afraid to ask questions in that class and often found herself feeling unmotivated to go to class although she attended.

Kellie and Mr. Henricksen's largest discrepancies were in the areas of simplicity of knowledge and certainty of knowledge with 9 and 10 point differences, respectively. In regard to the simplicity of knowledge, Kellie's score of 29 indicated more of a belief that much of knowledge is made up of isolated pieces of information (Schommer, 1994a). She reported that ideas and knowledge from different areas such as English, science, and math are "mainly separate." Mr. Henricksen, on the other hand, noted the interconnectedness of disciplines as well as the complexity of their interrelatedness. Kellie indicated that knowledge is always changing

but did not elaborate further than "it's always changing because there's always new advancements."

While Kellie struggled in Mr. Henricksen's class, she reported feeling more in sync with Mr. Farmer. She stated that "he just knows everything already. Just like whatever he says, I don't even second guess it. I know he knows what he's talking about." Upon further elaboration, Kellie noted that "he doesn't just stick to the book. He goes off and has everybody comment on it and everybody puts their opinion and it's not just a boring lecture." Interestingly, Kellie' ED score with Mr. Farmer was a 29 very close to her ED score with Mr. Henricksen. The largest discrepancies between Kellie and Mr. Farmer were also in the areas of simplicity and certainty of knowledge.

Observation. It was noted that Kellie sat on the periphery in both of her courses, which was against the wall. Yet, she actively participated in assignments in both courses. She was observed completing the assignments and seemed engaged in the work on the computer and listened attentively to lecture. She rarely spoke to the instructors or other students except for a short discussion with Mr. Henricksen and another student about the in-class assignment.

Grades. Kellie reportedly received a "D" in Mr. Henricksen's course and a "C" in Mr. Farmer's course.

Persistence. When asked if every class were like Mr. Henricksen's how likely was it that she would persist, Kellie stated, "I wouldn't." She indicated, however, that she would stay in school if all classes were like Mr. Farmer's. Kellie also claimed that a "teacher is not going to affect whether I come back to school or not. If I don't like him, I still have to come." She planned to return the next semester.

Academic Integration. Kellie noted that most of her interactions with faculty were in the form of questions about assignments that occur after class. She did not like to ask questions during class time. Kellie reported that one class last semester was the only class that influenced her personal growth or values. She held a fondness for the teacher and changed her major to that particular subject after completing the course. According to Kellie, there were not a lot of opportunities to interact with faculty besides the classroom. She felt that a university would offer more options in the form of student organizations and other activities.

Kellie reported that Mr. Farmer was approachable and seemed to be interested in her well-being as a student. She also claimed he had a positive attitude about teaching. She asserted that she did not feel this way about Mr. Henricksen. In her opinion, Mr. Henricksen "doesn't care to listen." Her example of this opinion related to an experience where a student asked a question, and Mr. Henricksen reportedly replied to the student that the answer was on the syllabus.

None of her classes seemed to influence Kellie' academic growth or interest in ideas or knowledge this semester. Again, she mentioned her instructor from last semester and how that facilitated her interest in a social science. She also reiterated her need for an instructor to be approachable so she could ask questions. Her concept of an approachable teacher is one that will answer her questions with direct answers.

Analysis. Kellie obtained the highest ED scores with both of her instructors and the highest overall EBI score with more naïve beliefs than other students and faculty chosen in the areas of simplicity and certainty of knowledge. Kellie was also the youngest of the students interviewed. Perhaps, her epistemological congruency levels impacted her academic experiences this semester as she did not seem academically involved at her college nor did she find any of her classes to influence her personal growth, values or career decision making.

She preferred Mr. Farmer's teaching, and subsequently she obtained a higher grade in his course. It does not appear that one can tie her levels of epistemological congruency with her grades, persistence or academic integration when comparing teachers separately. On the other hand, when one considers her high ED scores with both instructors, it is interesting to consider that her lower congruency levels may have accounted for her difficult semester as indicated by her grades and her desire to drop her liberal arts course.

Matilda

Matilda was a nineteen-year-old, second semester student at Cypress College. She stated that her GPA is between a 2.0 and 2.25. Reportedly, she chose Cypress College due to her need to complete some remedial courses and subsequently planned to transfer to a university. Matilda relayed troubles that she encountered in her formal education, especially in high school. She reported that if it had not been for administrators at her high school, she would not have graduated. According to Matilda, she would get in fights with other students and had difficulty resolving conflict. The student related that she has not always had a lot of family support in her education. Matilda was a talkative, friendly individual who freely offered her opinions and desires for her future. The EBI dimensions for Matilda and her instructors are presented in Figure 7.

Epistemological Beliefs and Classroom Experience. Matilda's ED score with Mr. Henricksen was a 22. Their largest discrepancies occurred in the areas of simplicity and certainty of knowledge. Matilda displayed more of a belief in the simplicity and certainty of knowledge with her scores being 28 and 22, respectively in comparison with Mr. Henricksen's score of 20 and 16, respectively. According to Matilda, Mr. Henricksen "gives too much work" but she also felt that "he's a pretty cool person." Throughout the semester, she found Mr. Henricksen to be

entertaining because of his sense of humor. She also liked the idea of the independent work meaning the instructor allowed some freedom in regard to turning in revisions of assignments, but then realized how "the work starts to crowd you." She stated that she had let her work accumulate and now she was overwhelmed. On the other hand, according to Matilda, Mr. Henricksen "does not take 'no' for an answer" and ultimately that helps her stay involved. She also reported that if she does not understand she "can go back to him, and he will make her understand." When she missed class, Matilda relayed that Mr. Henricksen came to her and told her she needed to show up and get her work done. She stated that these interactions made her feel "like he cares."

EBI Dimensions	Matilda	Mr. Henricksen	Mr. Fletcher
Fixed Ability	23	19	19
Simplicity of Knowledge	28	20	24
Omniscient Authority	17	15	16
Quick Learning	9	11	9
Certainty of Knowledge	22	16	16
ED Score		22	15

Figure 7. Matilda's ED scores across EBI dimensions.

On the other hand, she did not believe that one of her science instructors, Mr. Fletcher, cared about her academic career. Matilda reported that she did not like his style of teaching and did not find him to be flexible. She reported that when a test paper was returned, she was told that it was not good. She stated that she wanted to hear more from the instructor about her grade and how to make it better. To assist her in the learning process, she stated she needed some help from this instructor to include encouragement. Matilda noted that other students liked Mr.

Fletcher's style of teaching and planned to take his next course the following semester. She compared her interaction with Mr. Fletcher to be like having a boss "and you know you're doing everything good…but it's never right."

Her ED score with Mr. Fletcher was a 15, actually less than her score with Mr. Henricksen. Their largest difference occurred in the belief of Certainty of Knowledge with only a five point difference with Matilda possessing a stronger belief in the certainty of knowledge. Mr. Fletcher reported that he learned his teaching skills from really good instructors during his college years who actually taught you how to teach. He commented that he felt knowledge was always changing but some things, for example in, math seemed to stay the same. This belief was similar to Matilda's belief that some knowledge, particularly in math and English, stays the same. Mr. Fletcher relayed how it "breaks his heart" when students do not understand, and if he finds that he cannot get through to them, he suggests tutoring or instruction by a fellow classmate. He also gave participation points for attendance to encourage students not to miss class. Mr. Fletcher reported that he believes that "you can learn something by continuous study and getting help from someone" which he encourages his students to do.

Observation. On the day of the observation, Matilda was not present in Mr. Fletcher's class. It became evident as the semester progressed that Matilda had stopped actively engaging in the course. Matilda was engaged in the assignment in Mr. Henricksen's class and was actively completing the work. She sat with another student, and they conversed about the activity.

Grades. Matilda had not received her final grades at our last conversation but she reported her grades as a "D" in Mr. Henricksen's class and an "F" in Mr. Fletcher's. These were not verified by Matilda as she did not answer further emails.

Persistence. Matilda stated that if all classes were like Mr. Henricksen's she would likely stay in school although it was a lot of work. In regard to Mr. Fletcher's class, Matilda reported that she would not stay in school if all classes were like this one.

Academic Integration. According to Matilda, her teachers were "only there to do what they have to do, teach, whether we like them or don't like them, whether we come to class or not, they just come teach." She did not believe that her interactions influenced her personal growth, values, or attitudes. Matilda further noted that if more of her instructors would have shown concern it would have helped her. As it stood during the interview, Matilda was dropping out of school despite her claims that she is "not gonna give up on school because, like, I have some good education so I can get somewhere in life." She also noted that she was aware there was a deadline to drop but that she might have "messed around and missed the deadline."

In regard to her instructors' attitudes about teaching, Matilda believed that most of her teachers were not very positive toward helping students gain knowledge and their well-being as students. She again emphasized she felt a lack of interest on their part in her work. She found Mr. Henricksen's course and a social science course to be somewhat stimulating intellectually. Matilda acknowledged that she acquired some new knowledge this semester but she mentioned her interest in pursuing other careers (cosmetologist and LPN) that do not require extensive higher education.

Analysis. Matilda's semester culminated with her decision to leave higher education. She pondered several careers and seemed unsure of her career direction. During our interviews, Matilda relayed information about her struggles with her education specifically in high school. There were times when Matilda was not sure if she could finish school, but her principal worked hard with her to overcome obstacles. Matilda now felt that she was getting on the right track,

and her relationships with her family were improving. She talked about her mother visiting her (she did not live at home) and how they seemed to be able to talk more without conflict.

Despite her low congruency with Mr. Henricksen, Matilda found him to be helpful and believed that he offered her encouragement and some flexibility when needed. She did not feel that Mr. Fletcher's teaching style was conducive to her learning specifically in the area of motivation to attend class. She felt that his teaching style was too rigid. Her higher ED score with Mr. Henricksen may have affected her low grade received in his course. Her ED score with Mr. Fletcher was actually lower than her ED with Mr. Henricksen but did not seem to be related to her grade as she received an "F" in her science course. In addition, since she reported that she would not persist if all classes were like Mr. Fletcher's, her higher congruency level with her instructor was not related to her persistence.

Interestingly, Matilda's largest discrepancies with both instructors were located in the similar dimensions of simplicity of knowledge, certainty of knowledge, and fixed ability. This student's scores were most similar to Mr. Fletcher's in all areas. Yet, Matilda felt out of sync with this particular instructor. Matilda mentioned teaching style and student faculty interaction as particularly important to her motivation to attend class and in her learning. It is interesting to consider whether epistemological beliefs of these instructors influence their levels of student-faculty interaction and their actual teaching practices.

Based on our interviews, it appeared that Matilda did not feel comfortable in this academic setting. At the end of the semester, she stated that she could not stand to walk on the campus. There did not appear to be a good fit between this student and the institution. On the other hand, I suspected that Matilda desired to be more involved but did not quite know how to navigate the academic system. Her lower ED score with Mr. Fletcher was not positively related to her

academic integration; however, her in-class interactions with Mr. Henricksen seemed to have helped somewhat.

Carrie

Carrie was a 19-year-old second semester student at Cypress College. She reported her college GPA to be between a 2.0 and 2.25. Her reason for attending Cypress College was to take remedial courses and then transfer to a university. Carrie stated that she did not do well in high school and needed the courses to become better academically prepared. She also indicated that her father graduated from high school and her mother earned a bachelor's degree. Carrie was a very mild-mannered, pleasant young woman. The EBI dimensions for Carrie and her instructors are presented in Figure 8.

EBI Dimensions	Carrie	Mr. Henricksen	Mrs. Simmons
Fixed Ability	17	19	15
Simplicity of Knowledge	23	20	21
Omniscient Authority	23	15	13
Quick Learning	7	11	8
Certainty of Knowledge	14	16	14
ED Score		19	15

Figure 8. Carrie's ED scores across EBI dimensions.

Epistemological Beliefs and Classroom Experience. Carrie's ED score with Mr. Henricksen was a 19. In the semester, Carrie encountered frustration in Mr. Henricksen's class. She stated, "He's not organized. He doesn't make himself clear." Carrie reported that instructions were not always clear and that his sense of humor was distracting to her when she when trying to work in-class. She also did not think she had enough time to complete assignments. She did not like the

idea of re-doing assignments and when her work was "not completed, I feel frustrated 'cause I'm not like that. I do my assignments."

On the other hand, she found it helpful that she was able to work on the computer in class with their assignments and an outline was provided with information on the assignment. Carrie stated that it would be helpful in her learning if the instructor would not give so much work. She reported that she does ask questions in class for clarification but does not visit the instructor during office hours. She reported that students in the class frequently work together because everyone understands different pieces of information, and they fill in each other's blanks.

Carrie and Mr. Henricksen's largest score difference lied in the belief of Omniscient Authority with their scores being a 23 and 15, respectively. Carrie's score indicated more of a belief that knowledge is handed down by authority. This difference in belief could account for her frustration regarding re-doing her assignments. Carrie may have felt that the instructor has the knowledge to correct her mistakes, and she may not enjoy the process of finding and fixing her mistakes.

While Carrie had some difficulty in her liberal arts course, she reported enjoying Ms. Simmons's social science course. Her ED score with Ms. Simmons was a 15 which was a few points lower than her difference score with Mr. Henricksen. In regard to Ms. Simmons, Carrie reported, "I like her. She's organized. She goes by the syllabus. She talks. You know, she makes the class interesting when we're talking about subjects, you know." The student also stated that they complete in-class activities that make the class more interesting. In addition, Carrie noted that Ms. Simmons "gets your attention. It's good to have somebody that keeps your attention in class." The student further elaborated that "instead of doing just book work, she'll summarize it in her words. And you interpret it better when somebody talks about the real

world." Carrie reported that she asked Ms. Simmons questions to clarify information after class, although she usually understands her assignments.

The largest score discrepancy between Carrie and Ms. Simmons was in the area of Omniscient Authority with their scores being a 23 and 13, respectively. Ms. Simmons's score which was close to Mr. Henricksen's indicated less of a belief in knowledge being handed down by authority. Ms. Simmons relayed that a main concern for her as an educator is to never "prejudge a student." She further noted that there are many reasons why a student may not do well in a course and the teacher needs to consider the possible causes. She discussed how she tries to teach a particular lesson in different ways so as to reach different types of learning styles.

Observations. Carrie was attentive in both classes. She asked questions to fellow students, which seemed to be for clarification purposes. She also asked Mr. Henricksen about the assignment. Likewise, she seemed engaged in Ms. Simmons's class where she actively took notes and participated in a group project. She had the materials needed for her in-class work.

Grades. Carrie reported she earned a "D" in Mr. Henricksen's class and a "C" in Ms. Simmons's.

Persistence. Carrie explained that if all teachers were like Mr. Henricksen, she would not likely remain in school if she had to constantly re-do assignments or papers. She also stated that she is not sure if she would completely drop. "I just want to finish it out the best way…maybe going to the Writing Center and tutoring and stuff like that." If all classes were like Ms. Simmons's, Carrie claimed that she thinks she would do pretty well in school, and she would stay. During our second interview, Carrie related that she plans to obtain a nursing certification and will not be attending the community college next semester.

Academic Integration. Carrie described the main purpose of her interaction with faculty to be to clarify information. She stated that she would go to their office hours if needed and stated that when she has gone, the faculty members were always helpful. She stated that one of her teachers influenced her personal growth and attitudes by way of assisting Carrie in becoming more organized. Carrie found all of her teachers to be enthusiastic about teaching. She also stated that she learned about the various subjects that she took but none of her interactions with instructors influenced her career goals.

She again noted that she found Mr. Henricksen's teaching confusing, and she did not feel that she could develop a relationship with him. She reported all of her classes except Mr. Henricksen's stimulated her academic growth. She found it helpful that her other instructors, including Ms. Simmons, to bring in real world examples to which she related. She also liked the experiential learning activities in Ms. Simmons's class and the step by step approach taken by her reading instructor.

Analysis. Carrie enjoyed Ms. Simmons's class, and her ED score with Ms. Simmons was lower than with Mr. Henricksen indicating more epistemological congruency with Mr. Simmons. According to Carrie, she preferred Ms. Simmons's teaching style given its incorporation of real-world examples and activities. Carrie did not seem highly integrated into the academic community of the college although she mentioned how she would have become more involved with tutoring and the writing center, if needed.

Mr. Henricksen's and Carrie's largest discrepancy was in the area of omniscient authority with their scores being 15 and 23, respectively. Their most similar scores were in the areas of certainty of knowledge and fixed ability with a two point difference. Ms. Simmons's and Carrie's largest discrepancy was also in the dimension of Omniscient Authority with scores of 13

and 23, respectively. Their most similar scores were in the areas of Certainty of Knowledge and Quick Learning. It appears that in Carrie's case, there are other factors besides epistemological congruency working that affected her academic life in this particular semester. Teaching style seemed to have been a factor in Carrie's feelings of being in sync with a particular instructor.

It should be noted that Carrie's ED scores with instructors were fairly high in comparison to some of the other students. It is possible that higher ED scores are related to academic struggles that without some type of intervention lead to poorer grades, less integration, and withdrawing from higher education.

Conclusions

Based on these findings, it appears that epistemological congruency and students' experiences on the community college campus is complex. Although there may not be a direct relationship between grades, academic integration and persistence and epistemological congruency, patterns emerged when overall ED scores were considered. In the next chapter, I present a cross case analysis of the eight participants. Themes that emerged from this analysis are discussed, as well as implications of this research and ideas future research.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

The purpose of this mixed method study was to explore how epistemological congruency between teacher and student affects students' experiences. Researchers of personal epistemology note the need for further work in the area of students' and teachers' epistemological beliefs and classroom experiences (Hofer, 2002a; Kuhn & Weinstock, 2002; Olafson & Schraw, 2002; Schommer, 1994b; Schommer-Aikins, 2004). The participants consisted of eight students and eight instructors at a community college in the Southeastern United States.

The theoretical perspective guiding this study was Schommer's (1990, 1994a) theory of epistemological beliefs and Tinto's (1975, 1987, 1993) theory of student departure. Quantitative methods were used to ascertain epistemological difference (ED) scores followed by student and faculty interviews and observations. Recall that epistemological congruency (EC) refers to the level of congruency between students' and faculty members' epistemological beliefs. After determining the scores on the five dimensions of epistemology as measure by the EBI, epistemological difference (ED) scores were computed. Specifically, the deviation between student and faculty scores across all five categories were calculated. These sums of the deviation scores are considered epistemological difference scores. Therefore, higher epistemological congruency is indicated by lower epistemological difference scores.

The main research question that guided this study was:

How does epistemological congruency affect students' experiences?

The research sub-questions were:

1. Is there a relationship between epistemological congruency and students' grades? If so, what is the nature of the relationship?

2. Is there a relationship between epistemological congruency and students' academic integration? If so, what is the nature of the relationship?
3. Is there a relationship between epistemological congruency and students' intentions to persist? If so, what is the nature of the relationship?

This chapter begins with a discussion of the findings of the study in relation to each research question. Next, recommendations for higher education are given followed by suggestions for further research.

Discussion of Results

The research questions were addressed through data collected from the EBI, student and faculty interviews, observations of six students in two classroom settings and two students in one setting. A discussion of each research question with regard to the findings from the cross case analysis is offered below.

How Does Epistemological Congruency Affect Students' Experiences?

After data were coded and categories emerged through constant comparative analysis, results revealed that epistemological congruence influenced students' diverse experiences in the classroom. The students' perceptions of the liberal arts course were varied. The first theme that emerged was that, for the most part, students with higher levels of congruency with the instructor (lower ED scores) seemed to navigate fairly well through the course and felt fairly in sync with the instructor in regard to his teaching style and assignments. They appeared to be able to handle any frustrations or ambiguities they encountered in the course while maintaining a direction towards successful course completion. For example, Victor (a student with higher congruency) stated that you "get accustomed to his teaching method." He further noted that he had fun with Mr. Henricksen's teaching style and felt challenged. Allen, a higher congruent student, stated

Mr. Henricksen "is refreshing…he's not monotonous…he keeps my attention." He also found Mr. Henricksen helpful in regard to feedback on assignments. Connie did not always feel in sync with Mr. Henricksen. She stated that it depended on the assignment. On the other hand, she felt that Mr. Henricksen was really interested in students' improvement of their academic skills. She also formed a study group and planned to successfully complete the course, which she did with a "C." Becky was also not always in sync with Mr. Henricksen's assignments and sometimes wished the assigned work was more interesting, but she also felt that Mr. Henricksen was a good teacher. She mentioned having difficulty hearing the instructor as an additional challenge.

Students with lower levels of congruency seemed to struggle more through the course and more often reported feeling overwhelmed or frustrated with the assignments or teaching style of the instructor. They relayed feeling that their performance was hindered by not having specific questions answered by the instructor. There was an exception in that one student with low congruency, Matilda, felt fairly in sync with the liberal arts instructor. Troy expressed frustration over not getting specific feedback on his work. The student expressed a desire for Mr. Henricksen to "tell me what's wrong…give me an example." Troy also sensed that he and Mr. Henricksen "misunderstood each other a lot during the semester." Kellie wished that she could drop the course but planned to stay. The student also remarked that she "did not learn anything from him." According to Kellie, the instructor moved too fast and, she was irritated by re-doing assignments. Carrie also expressed frustration with re-doing assignments and stated "I get confused with him a lot of times." According to Carrie, she finds the instructor's sense of humor distracting and his assignments are not clear to her.

Interestingly, students with higher levels of congruency with the initial liberal arts instructor also had higher levels of congruence with the other instructors. Overall, there were not large

differences between students' ED scores with the liberal arts instructor and the instructor that they felt more or less in sync with. This similarity may be because of the lack of overall variability of EBI scores among the instructors. The Figure 9 outlines ED scores and grades.

Student	ED Liberal Arts	Liberal Arts Grade	ED Student-Selected Course	Student-Selected Grade
Victor	4	B	17	A
Becky	10	C	13	A
Allen	10	B	9	B
Connie	12	C	9	B
Carrie	19	D	15	C
Matilda	22	D	15	F
Troy	23	A	18	A
Kellie	28	D	29	C

Figure 9. Student ED scores and course grades.

If an ED score of 16 is used as a cut off score, it is interesting to note that five of the eight students had relationships with both faculty that could be classified as either highly congruent or as low congruent. For example, Allen, Becky, and Connie were considered highly congruent with both instructors. Troy and Kellie were considered low congruent with both instructors. Future research could be done with a larger number of faculty in attempt to obtain higher variability among scores which may give more insight into congruency levels between student and faculty and other factors that may mediate congruency levels.

A second theme that became apparent was miscommunication or a disconnect between teachers' intentions of various teaching methods and students' perceptions of those intentions and methods. This theme leads to the questions of 1) how do students interpret various expressions of instructors' epistemological beliefs? and 2) to what extent and in what ways do epistemological beliefs manifest in teaching practices? An example of this miscommunication or disconnect occurred with Mr. Henricksen and some of his students. This instructor emphasized

his desire for students to become involved in their learning and to learn to find some of their own answers, perhaps related to his belief that individuals have a role in their own learning and knowledge does not have to be handed down by authority. While some students interpreted this as challenging, others were frustrated. ED scores seemed to be somewhat related in that Victor, Connie, and Allen (three of the four with higher epistemological congruency with Mr. Henricksen) seemed to be able to work within these parameters, while Troy, Carrie and Kellie (with lower epistemological congruency) indicated that they found it difficult to follow this teaching style. These students also interpreted Mr. Henricksen's methods as a lack of interest in their academic experiences when Mr. Henricksen simultaneously expressed his interest in the students' academic experience by noting his desire for them to become more engaged in their education.

A second example of disconnect includes Allen's feelings that Ms. Stein did not provide much teacher-student interaction, and Ms. Stein seeing the significant need for her to be very involved in student learning in the community college setting. Where does the disconnect between teachers' intentions and students' perceptions of those intentions occur? Matilda and Becky seemed to be the exceptions in this case. While Becky was more epistemologically congruent with Mr. Williams, she did not find aspects of his teaching style helpful or conducive to her learning. On the other hand, Matilda seemed to be fond of his teaching style and thought he was interesting. It should be noted, however Matilda did not do as well in the course in regard to final grade as Becky.

A third example of disconnect is Connie's initial feelings regarding Ms. Smith. It seemed as though Connie was irritated and frustrated in Ms. Smith's class at the beginning of the semester. She reported that she did not understand the point of and did not enjoy the homework. She

believed that the homework was not relevant to her overall understanding and of course material. Additionally, Connie noted that Ms. Smith often used examples from other disciplines to make points in the classroom. Connie felt that these examples were confusing and not relevant to the particular task at hand. She was further agitated by required class participation where students would discuss their homework or in-class assignments.

As the semester progressed, Connie began to make the connections regarding Ms. Smith's use of examples from other disciplines to offer students a wide range of examples in addressing her particular lesson. Also, Connie expressed her belief that Ms. Smith was genuinely concerned for her well-being as a student. When asked why she changed in her opinion regarding Ms. Smith's concern for her as a student, Connie reported that Ms. Smith frequently told the students that she cared about their future academic career and relayed to the class the importance of asking questions and speaking up if they needed help.

Perhaps, Connie underwent Schrader's (2004) concepts of "epistemic threat" and "epistemic stretch." Recall that epistemic threat, according to Schrader (2004), is "a challenge to old epistemic assumptions and perspectives" (p. 89). Connie's epistemic beliefs were challenged by the way Ms. Smith presented material and assigned homework. Then, since she felt cared for and supported in the classroom, epistemic stretch occurred as Connie felt challenged in the classroom, tried out her new beliefs and ultimately felt differently about this instructor.

A third theme that emerged is related to the likeability, personality characteristics, or teaching styles of the instructor. Students seemed to do better in courses where they expressed a fondness for the instructor or at least the instructor's style of teaching. A question emerges regarding the role that students' and instructors' epistemological beliefs may play in students' perceptions of what they consider to be "good teachers" or likeable teachers. An additional question arises

regarding how teachers' epistemological beliefs are translated into classroom practice. Individual students' ED scores did not seem to be related as to why they reported feeling more in sync or out of sync with a particular instructor. For Kellie, her ED score with Mr. Farmer was one point higher than her score with Mr. Henricksen, and for Troy his ED score with Mr. Farmer was five points lower.

Both students reported that Mr. Farmer did not simply follow a strict lecture format straight from the textbook. Students were invited to discuss their opinions on various topics. In addition, both students reported that Mr. Farmer was more approachable than some other instructors and seemed interested in their intellectual well-being. Schrader's (2004) concept of intellectual safety may offer an explanation for this finding. She suggests that in an intellectually safe climate teachers foster mutual respect and they invite all learners to work collaboratively in the construction of knowledge. Perhaps when teachers' acknowledge learning differences and approaches, the congruency level of instructor and student is not as relevant as how the students' interpret their environment.

Mr. Barett, chosen by Becky as an instructor with whom she felt more in sync, discussed his way of laying groundwork for the students and then allowing them to discover their interests. He stated how he gives them the incentive

> That they can kind of go where they're most interested. And I feel like more students could kind of do that, rather than forcing things upon them, they are able…then they can kind of get into that study area of that subject or ground where they can have more interest and find more success…be more apt to…master a subject and really, really understand the subject more.

Both of these instructors acknowledged that students come into the classroom with diverse experiences which could be likened to Schommer's (1993b) concept of "epistemological baggage" (p. 368). Schommer (1993b) states that students come to higher education with epistemological baggage which can either help or hinder student learning. The question becomes: Are the effects of differences in congruency levels mediated by instructors' acknowledgement of differences and subsequent teaching methods or styles that attempt to reconcile those differences? Mr. Farmer stated that he tries to allow students to come up with their own ideas and theories about the assigned reading, and he refuses to interpret the text for them. At the same time, he claims that he does not wait for students to come to him with questions. He remarks, "I have to go to them and say, okay, if you don't know this, we need to spend some time on this."

Based on findings, epistemological congruence affected students' experiences in the classroom. Three of the four students with higher epistemological congruence with Mr. Henricksen seemed to fair better in the course than did their lower congruency counterparts. The higher congruent students felt more in sync with his teaching style and with assignments. In addition, in general, students with lower ED scores with Mr. Henricksen also had lower ED scores with their other chosen instructor. In the same course, students held different interpretations of the instructors' teaching styles and intentions. Three of the students with higher congruence seemed to be less frustrated in the class and were able to accomplish their work. Overall, there were miscommunications or disconnects between teachers' intentions and students' interpretations of those intentions. Last, students seemed to do better in courses where they expressed that they liked either the instructor or their teaching styles.

Baxter Magolda (2000) states the importance of teachers recognizing that students' unique background experiences and diverse paths in their growth and development can mediate their learning. Therefore, it seems it would be relevant for teachers to consider students' epistemological beliefs and how students' experiences are framed by their beliefs. Additionally, Grubb's (1999) concept of disequilibrium may also be relevant to understanding students' classroom experiences. He states that disequilibrium occurs when teachers do not consider how students approach learning or what teaching methods work or do not work for particular students (Grubb, 1999). Perhaps, disequilibrium occurred in various classrooms resulting from incongruent epistemological beliefs between teachers and students leading to students not feeling in sync with instructors. Further research should address how teachers' epistemological beliefs are translated into classroom practice and in turn, how students interpret expressions of instructors' epistemological beliefs.

Sub-question #1: Is There a Relationship between Epistemological Congruency and Students' Grades? If So, What Is the Nature of the Relationship?

In higher education, grades are considered indicators of a student's academic performance. Bean and Metzner (1985) summarized findings of retention research and found that "college academic performance has been a consistent and powerful predictor of persistence in numerous studies at various types of institutions" (p. 521). Findings of this study indicated that students with overall lower ED scores, as in the cases of Victor, Becky, Connie and Allen, seemed to fair better grade-wise. In other words, students who were more epistemologically congruent with their instructors obtained higher grades. Troy was the exception with his ED scores being somewhat higher; however, Troy had a lower EBI score in comparison to students and instructors. He also obtained higher grades.

While individual ED scores did not seem to be related to grades, the students who were initially identified as having higher congruency with Mr. Henricksen also had higher levels of epistemological congruency with other instructors as well. Their grades were somewhat higher than their lower epistemological congruency counterparts. Pearson correlations were computed for scores on the five epistemological dimensions and combined student GPA for the two courses (liberal arts and student selected course) and are listed in Table 3.

Table 3
The Relationship between Epistemological Beliefs and Student Grades

Epistemological Beliefs	*N*	GPA[b]	
		r[a]	*p*
Fixed Ability	8	-.666	.072
Simple Knowledge	8	-.863	.006
Omniscient Authority	8	-.601	.115
Quick Learning	8	-.006	.877
Certainty of Knowledge	8	-.594	.121

[a]Pearson's Product Moment Correlation coefficient.
[b]Combined grade from liberal arts course and student-selected course

There was a significant correlation between the dimension of simple knowledge and grade in the liberal arts course ($r = -.863$, $p < .006$). This negative relationship indicates that the more the student believed in the simplicity of knowledge (knowledge is made up of isolated bits and pieces of information), the lower their grade. This correlation is considered high (Hinkle et al., 2003).

Correlations between the dimensions of Fixed Ability and Omniscient Authority and GPA were not significant, although their coefficients were -.666 and -.62, respectively. While not significant, the correlations are considered of moderate strength (Hinkle, Wiersma & Jurs, 2003). These negative relationships indicate that the more students believed in these dimensions the lower their grades in both courses. This relationship suggests that students who feel knowledge is handed down by authority tended to make lower grades in these courses. Students who held a stronger belief that intelligence is innate rather than acquired also tended to have a lower GPA. These findings suggest that these dimensions could be more important to successful grades.

The dimension of simple knowledge appeared to be highly associated with students' grades. This finding suggests that this particular dimension could be somewhat more relevant to successful grades. This finding is in line with Rukavina and Daneman (1996) who found that students with more mature beliefs about the complexity of knowledge demonstrated greater knowledge acquisition overall than students with immature beliefs. Schommer, Crouse, and Rhodes (1992) found a negative relationship between performance on a mastery test and belief in simple knowledge. In addition, they found that epistemological beliefs may have an indirect effect on academic performance due to the possibility that beliefs about knowledge may influence study strategies used by learners.

To summarize both course grades and EBI scores, Figure 10 outlines students' EBI scores and course grades. The chart begins with Troy, who obtained the lowest EBI score indicating more sophisticated beliefs, to the student with the higher score indicating more naïve beliefs.

Correlations between EBI score and liberal arts grade and the selected course grade of were completed. The EBI had the highest correlation with the liberal arts grade (r = -.813, $p<.05$). This relationship indicates that the higher the EBI score, which indicated more naïve beliefs, the lower

the liberal arts grade. While the relationship between the other course grade and EBI scores was not significant, it is considered a relationship of moderate strength, (-.688) by Hinkle et al. (2003). There was a negative, significant relationship between EBI score and GPA of both courses (r = -.794, p<.05).

Student	EBI Score	GPA
Troy	58	4.0
Allen	71	3.0
Becky	73	3.0
Carrie	84	1.5
Victor	85	3.5
Connie	91	2.5
Matilda	99	.5
Kellie	105	1.5

Figure 10. Student EBI scores and combined GPA.

To consider the relationships between epistemological difference scores and course grades, correlations were also completed. These correlations were not significant. The relationship between ED for the liberal arts course and the liberal arts grade yielded only a low relationship (-.387) (Hinkle et al., 2003). The association between the ED scores from the student-selected course and student-selected course grades was insignificant (Hinkle et al., 2003). Therefore, epistemological congruency levels, as determined by ED scores, do not appear to be significantly related to student grades.

In sum, the dimension of simplicity of knowledge was highly associated with student grades in both courses. While not significant, fixed ability was found to have a moderate negative

association with student grades in both courses. In addition, EBI scores were found to have a high degree of association with the liberal arts grade. The nature of this relationship was such that the lower the EBI score (more sophisticated beliefs) the higher the liberal arts grade. The relationship was not as strong for the EBI and other course grade although a moderate relationship was found. Recall the student-selected courses were from a variety of disciplines. It is interesting to consider Kitchener's (1983) theory that epistemic assumptions affect higher-order thinking but seem not to impact lower-level problem solving. Perhaps, some of the courses involved in this study required these different levels of problem solving. Subsequently, students' and instructors' congruency levels were not as relevant due to the course content or presentation of course content.

Further research should be completed to explore disciplinary differences and epistemological congruency.

Sub-question #2: Is There a Relationship between Epistemological Congruency and Students' Academic Integration? If So, What is the Nature of the Relationship?

Students with lower overall ED scores (higher epistemological congruency) seemed to be somewhat more integrated into the academic community. For example, Victor, Becky, and Allen had conversations with instructors and seemed to feel comfortable interacting with their teachers. Allen reported using office hours and email to communicate with faculty. Allen also stated that he developed an appreciation of learning for its own sake because of his faculty interactions. While Victor did not desire more interaction, he expressed that he did interact with instructors and was not afraid to ask questions. Becky was somewhat integrated into the academic community because of her academic relationship with Mr. Barett whereby she and other students worked on outside projects with him and reported that she participated in conversations with him about class work.

Troy, Kellie, Matilda, and Carrie, those students with higher ED scores and less epistemological congruency, either did not desire more teacher-student interaction or did not seek further interaction even when they knew of some academic services available. Troy reported that he really did not see any need for more faculty interaction besides asking questions for clarification. Kellie did not really see much opportunity for interaction with faculty but she also did not express a desire to have more interaction. She wanted questions answered by faculty in a direct, clear manner. Carrie was aware of tutoring services and a writing lab but did not feel she needed it even though her grades were a "D" in the liberal arts course and a "C" in the social science course. Matilda described little interaction with faculty and believed more interactions would have helped her academically.

There were two exceptions to the above findings. Connie, who had lower ED scores, did not want a significant amount of interaction with faculty while Matilda expressed a desire for more. At this point, it is important to consider how various issues such as family support and personality characteristics of students impact a student's persistence because of the differences between Connie and Matilda. For example, Connie reported having an effective support system while Matilda seemed to be more on her own. Connie also reported being shy and not wanting to talk or to offer her opinions in class. Matilda wanted more interaction and reported being comfortable offering her insights in class. It might be interesting to consider how epistemological beliefs and various personality characteristics might interact to impact a student's learning experience. If students believe that knowledge is derived from authority, and they are more inhibited in class, then how comfortable would they be or what would their motivation be to share and become actively engaged in classroom discourse?

Another noteworthy response in regard to academic integration concerned Becky's reference to all of her instructors, excluding Mr. Barett, as "bosses" at places of employment and a later reference to them as "authority figures." She referred to her instructors in this manner when asked about her interactions and relationships with her teachers. Her academic integration was tied to her interactions with Mr. Barett because of his willingness to seek student input and offer various options for assignments, according to Becky. Yet, her ED score with Mr. Barett was 3 points higher than with Mr. Henricksen. It appears that in Becky's case there are other factors that influenced her integration into the academic community.

Based on student interviews, the relationship between epistemological congruency and academic integration is complex. Students with lower overall ED scores, and therefore, higher epistemological congruency with both instructors appeared to be somewhat more integrated into the academic community of the college. Kellie, Troy, and Carrie, students with higher overall ED scores, did not appear to perceive a benefit from interacting with faculty; subsequently, they did not seek the interaction. With the exception of Allen, none of the students were highly integrated into the academic community.

Sub-question #3: Is There a Relationship between Epistemological Congruency and Students' Intentions to Persist? If So, What Is the Nature of the Relationship?

Higher epistemological congruency seemed to be related to student persistence. Victor, Becky, Connie, and Allen, all students who were congruent with Mr. Henricksen, reported that they would return next semester while two of the four low congruency students, Matilda and Carrie, will not be returning to higher education. In analyzing these findings, it is relevant to consider Tinto's (1993) theory of student departure and Schrader's (2004) concepts of epistemic fit and stretch as well as moral atmosphere and intellectual safety.

Tinto's (1993) theory of student departure suggests that students may not integrate into the academic community because of incongruence. He states, "Incongruence refers in general to the mismatch or lack of fit between the needs, interests, and preferences of the individual and those of the institution" (p. 50). Perhaps, the students' epistemological incongruence with their instructors either directly or indirectly influenced their fit with the institution. Students such as Matilda and Carrie with higher ED scores likely met with occasions where they experienced incongruence between their needs and goals and what they perceived those of the institution to be. Although Kellie stated she would return to higher education, her grades of a "C" and a "D" were not exemplary. While the students with higher ED scores also likely met with adverse situations, perhaps having ED scores closer to their instructors' scores mitigated the effects of these experiences.

In addition, Schrader's (2004) concepts of "epistemic stretch" and "fit" between a student and teacher's epistemology may also be relevant to the analysis. Schrader (2004) suggests that students experience an unsafe classroom as one where there is lack of epistemic fit between instructor and student and a classroom lacking a moral atmosphere. Yet, she suggests that epistemic fit between teacher and student alone is not enough to account for students feeling unsafe in the classroom; one must also consider moral atmosphere. When students do not feel emotionally and interpersonally supported, as when they are challenged in their belief systems, conditions for epistemic change are not created (Schrader, 2004). Epistemic stretch cannot occur without intellectual safety and a moral atmosphere. Subsequently, these students not only feel uncomfortable in their current beliefs but also do not feel safe enough to try out new ones. These feelings may have led some of the students in this study to obtain low grades and not feel in sync with some of the instructors. It also could be that the "level" of the epistemological belief may

affect the ability to engage in Schrader's (2004) concept of epistemic stretch. In other words, when individuals with more naïve beliefs are confronted with certain types of new information, they may not be able to make meaning of this contradictory information. However, it could also depend on how the material is presented to them.

Based on these findings, it appears that epistemological congruency is related to students' experiences on the community college campus, even if its effects are indirect. Although there may not be a direct relationship between grades, academic integration, and persistence and epistemological congruency, patterns emerged when overall ED scores were considered. Students with lower overall ED scores seemed to fare better with grades, persistence, and academic integration. When comparing ED scores of students and individual instructors who were chosen by students, differences were not as apparent. Likeability of the instructor or other personality characteristics likely influenced students' experiences. In addition, a question emerges regarding how teachers' beliefs are translated into classroom practice if at all. Implications of this research and ideas of future research are discussed below.

Implications for Higher Education

Schommer (2002) states that an underlying theme of the study of epistemological beliefs is to understand the learner's perspective. Several researchers (Hofer, 2002b; Kuhn & Weinstock, 2002; Olafson & Schraw, 2002; Schommer, 1994b; Schommer-Aikins, 2004) note the need for further investigation into the role of personal epistemology in the college classroom. This study was conducted to provide insight into students' and instructors' epistemological congruency levels and how their congruency may or may not be related to various academic experiences. Some important recommendations for higher education arose from this study.

Teaching and Learning

Understanding learners in the classroom is an integral part of the teaching and learning process. Hofer (2002a) states that "beliefs about knowledge and knowing have a powerful influence on learning, and deepening our understanding of this process can enhance teaching effectiveness" (p. 13). The exploration of a student's epistemological beliefs is rarely, if ever, a part of a student's classroom experience. None of the students in the study reported having discussed their beliefs in any college class, and none of the instructors reported having inventoried their epistemological beliefs prior to this study. Baxter Magolda (2000) suggests that faculty and students would benefit from dialogue at the onset and during a class about the nature of knowledge, the justification of their beliefs, and the role of students, teachers, and other classmates. She adds that this dialogue may provide insight into how students make meaning and how the meaning making process could affect learning in the course.

Baxter Magolda (1992b) discussed how higher education's pedagogy focuses on an objectivist epistemology and how higher education could draw on students' epistemologies as a foundation for reshaping pedagogy. She drew upon Parker Palmer's (1998) belief that higher education should cultivate mutual exchange and complex thinking to clarify her point that the objectivist epistemology focuses on the transmission of knowledge from teacher to student with success defined as the ability to reproduce this knowledge. All instructors in this study reported that their epistemological beliefs likely influence their teaching styles and what they do in the classroom such as method of testing and types of assignments.

For example, when Ms. Stein was asked if she thought that it was possible to learn a topic over time as opposed to the belief that ability to learn is fixed, she stated she feels this belief influences her approach in the classroom. She stated, "I try to always maintain, you know,

something open, where if you don't understand it, you can come to me and I'll explain it." She further emphasized, "I think it's important to realize that people learn things differently…So the best we can do is experiment with the different ways and get them to learn." Further, when asked, "Does it help in your learning if you study a particular topic over time or do you figure, if you don't understand it from the beginning, you probably won't?" Mr. Fletcher responded, "I disagree with that altogether. You can learn something by continuous study and getting help from someone."

It may also be relevant for instructors to focus on exploring some epistemic dimensions more than other with their students. Based on findings of this study, the dimension of Simple Knowledge was highly associated with both course grades. The less the student believed that knowledge was made up of isolated bits of information the higher their grade. It might prove helpful for teachers to assess and to consider students' beliefs in this area. They could use this knowledge to design assignments and shape their instruction to provide students with the opportunity to be exposed to different ways of and deeper thinking about the discipline being studied.

This study did not address how epistemological beliefs of students may vary across different disciplines. Schommer, Duell, and Barker (2003) state that "one characteristic of personal epistemology that remains elusive is the degree to which an individual will hold similar beliefs across academic domains" (p. 350). Results of their study suggest that undergraduate college students' epistemological beliefs are moderately domain general (Schommer et al., 2003). In other words, students' beliefs are similar across different disciplines. Further, Schommer and colleagues 2003 note academic experience, or knowledge of and exposure to various disciplines informs how students apply their beliefs across disciplines. They suggest that students' beliefs

may need to be addressed across the hard and soft sciences to discern if beliefs they hold for mathematics are similar to their beliefs in relation to the social sciences.

Retention

When considering Tinto's (1993) concept of incongruence, it seems likely that epistemological congruency could impact a students' feelings that they do not fit into or are at odds with the social and intellectual fabric of the institution. Matilda, who was at the lower end of congruency with her instructors, stated how she would not be returning to higher education in the near future and did not really even want to be on the campus. In addition, Carrie who was also considered to have lower congruency with instructors was also not planning to return to higher education despite her report that overall she was satisfied with the college and most of her teachers. While Kellie stated she was returning to college next semester, her GPA in the two courses involved in this study was a 1.5. Further research should be done to investigate the concept of incongruence, epistemological congruency, and student departure.

Schommer and Walker (1997) discuss that if students' epistemological beliefs are assessed when entering higher education, then students who might need individual academic assistance could be identified. On the other hand, Schommer and Walker (1997) also note that epistemological beliefs should not be used as a standard to eliminate students.

Social Equity

If the understanding and development of epistemological beliefs are to be valued in higher education, then one must also consider implications of this value. How will the experiences of the student who has naïve beliefs as compared to the student with more sophisticated and mature beliefs differ? Will the student with more naïve beliefs be labeled and subsequently treated differently in the classroom? Schommer (1992) found that some demographic characteristics and

factors related to upbringing predicted adults' epistemological beliefs. One such finding indicated that the more education the participants' fathers had, the "less likely they were to believe in simple knowledge and certain knowledge" (Schommer, 1994a, p. 179). This finding suggests that some students could be at a likely disadvantage in terms of socioeconomic levels; therefore, how measures of epistemological beliefs are interpreted and used by higher education should be carefully considered. Future research should consider the benefits of assessing students' epistemological beliefs for students and teachers.

Advising

College advisors provide crucial services to students throughout their academic career. Many times advisors are informed by students of difficulties they encounter in the classroom with either an instructor's teaching style or personality characteristics. Often, students do not understand why they do not like a particular course or teaching style. The students in the study could not seem to articulate the problem they were having in a course beyond the following examples: the course is too difficult (too much work), not interesting, did not like various personality characteristics of the instructor, or that they were uncomfortable in the class. If advisors and students could discuss possible reasons for their difficulties, students may not attach their difficulties to their abilities and experience decreases in self-confidence. Self-discovery is an important part of the journey in higher education and exploring one's beliefs about knowledge and knowing are an important part of the process.

Overall, students with higher epistemological congruency seemed to fair better in regard to grades, academic integration, and intentions to persist. A discussion about their beliefs led by instructors would likely be informative to both students and their instructors. If a student could explore their belief system, something in line with surveying their learning styles, it might take

the mystery out of the equation thereby lessening the problem. For instance, if a student realizes that they do not like to talk in class because they seem to feel that the instructor is the only authority, then they could begin to see their role as a student differently.

Future Research

Further research on epistemological congruency is needed to understand the implications of this concept to assist students and teachers in the teaching and learning process. In addition, there appears to be some effects of EC on students' grades, academic integration, and persistence worthy of further investigation. There are several avenues that could be considered in future work in this area.

First, since there was a significant correlation between grades and the belief in the simplicity of knowledge and moderate correlations between grades and the dimensions of omniscient authority and fixed ability, then it seems prudent to complete more research in these areas. Specifically, it would be important to consider these beliefs across different disciplines at other various types of institutions since this study did not focus on discipline specific aspects of beliefs as students chose the other course studied and there was no uniform sampling across disciplines. It would also be of value to consider that learning may not be correlated with good grades. Students may have concluded that they learned more in courses in which they received lower grades. A future study that considers this possibility may provide deeper insight into students' perceptions of their academic experiences.

Second, in addition, this study occurred at one community college in the Southeastern United States. It would be relevant to include four-year institutions in the study and consider how there may or may not different findings across the types of institutions. For example, is epistemological congruency more critical at different types of institutions and if so what

characteristics of the institution make it more critical? How does this critical level impact students in their college decision making process? This particular community college was relatively small in regard to student population and enrollment in courses was limited to approximately 25 students. When classes are smaller, there is likely more opportunity for student-teacher interaction. The smaller class size at Cypress College was conducive to interactions, whereas in other settings with large class sizes, students may not have the opportunity to interact substantially with faculty. For this study, it was important for students to be able to comment on their interactions with faculty. Therefore, the setting of this study likely allowed for students to offer more observations and perceptions of their classroom interactions than if they were enrolled in a class with 300 students.

Several participants in this study were attending the community college before moving on to a university. One student reported that he planned to obtain an associate's degree at Cypress College and then transfer to a university. Therefore, this population of participants held a certain set of educational goals which may or may not affect the outcome. For example, some students in the study did not appear to be highly integrated into the academic community of the institution, which could have been due to their goal of attending the college to either bring up their GPA or complete developmental courses. Students who are investing their time to obtain a degree from the institution may desire more involvement. Future research should include a larger sample of students whereby various educational goals are represented and the differential impact of diverse goals can be considered.

Third, this study did not address how teachers' beliefs are translated into classroom practice. Several researchers have noted the importance of this area in the study of personal epistemology (Bendixen & Rule, 2004; Hofer, 2004c; Olafson & Schraw, 2002; Schommer, 1994a). This type

of study would involve thick description of classroom observations over a period of time. In addition, a question arises regarding the possibility that there are mitigating factors that impact how a teacher's beliefs might operate in the classroom. For example, some faculty members discussed how they are given a master syllabus to follow which outlines which topics to cover in a semester along with some prescribed assignments. Schraw and Olafson (2002) found a discrepancy between what teachers espouse as their teaching styles and what they actually do in the classroom. Future research could be directed at how instructors' beliefs are translated into classroom practice, while also considering other factors that might mitigate how their beliefs influence their teaching methods. In addition, the complexity of assuming that individuals' beliefs translate into behavior is not only an issue for teachers' behaviors but also for students' behaviors. There are likely factors that influence how students' beliefs are enacted in the classroom or in their academic lives. For instance, financial strain, lack of family support, or low self-esteem may affect the way a student spends their time both inside and outside of the classroom. The student may have the belief that learning can occur gradually and that if they study hard enough they will succeed. On the other hand, if the student works 40 hours per week and cares for children in the evening, their study time will be severely limited. Subsequently, the student may not be able to enact their belief. Future research could be completed to explore students' beliefs in relations to their actual behaviors while considering other factors that may influence their behavior. Again, this type of study would involve spending a prolonged amount of time with students.

Fourth, more exploration is needed in regard to the disconnect between student perceptions and teacher intentions in teaching styles and methods and the role epistemological congruency might play in this context. This disconnect was a finding of this study but not specifically

explored. The finding also leads to the question: How do congruency levels impact students' interpretations of their classroom community? Since this study explored the opinions of eight students, perhaps including more students would offer more definitive findings in this area. A common goal among faculty was the desire for students to be responsible in their learning. It was interesting to hear students' perceptions of this desire and what that meant to them. Some saw it as a challenge and others as an annoyance. Usually, it was students with higher epistemological congruency and lower EBI scores that negotiated the challenge fairly well. This phenomenon should be further investigated.

Fifth, this study did not consider gender and how it might impact epistemological congruency levels and students' experiences. Two of the female students (Connie and Kellie) discussed how they really did not like to talk in the classroom and preferred direct answers from instructors to their questions. Baxter Magolda (1992b) found that gender-related patterns existed in three of her four ways of knowing. Specifically, her study "resulted in a gender-inclusive model in which women and men share similar epistemic assumptions, yet approach them via gender-related reasoning patterns" (Baxter Magolda, 1999, p. 42). Additionally, Belenky and colleagues (1986) found patterns in women's ways of knowing that differed from Perry's (1968/1970) scheme. Therefore, future research could be completed using the EBI to consider how students' epistemological beliefs might be filtered through the lens of gender due to different socialization experiences. In addition, gender was not considered when taking into account students' perceptions of their instructors as teachers. Perhaps, students respond differently to instructors based on that particular instructor's gender.

Sixth, only 8 instructors participated in this study and variability among their EBI scores was low. Future studies could include a larger sample of participants to ensure not only a greater

number of students and instructors with low and high epistemological congruency but also varying levels of epistemological congruency between teachers and students. Studying these diverse levels might provide insight into what levels of congruency are most advantageous for the teaching and learning process.

Seventh, as Schraw and colleagues (2002) note, more research is needed for development of the EBI. The EBI proved to have better predictive validity than Schommer's EQ in regard to measures of reading comprehension and explained 60% of total sample variation as opposed to the EQ's explanation of 35.5% (Schraw et al. 2002). Additionally, the EBI was more reliable over time than the EQ, and the EBI did not have any obvious interpretive problems as each of the factors was conceptually distinct (Schraw et al, 2002). Questions remain regarding the construct validity of this instrument (Schraw et al., 2002). It would be useful in construct validation to consider the outcomes of the EBI in relation to the measure of the psychological constructs of cognitive complexity and learning styles. Both of these constructs consider how individuals perceive and process information which could provide further insight into the use of the EBI in academic settings.

The EBI was also validated on two hundred and twelve students enrolled in an introductory educational psychology class at a large Midwestern university (Schraw et al., 1995). This study was completed at a community college. Future research is needed to consider the implications of the use of the EBI in different educational settings to determine if results are affected by the context of the study. Since community college students may have different academic or social backgrounds than university students, it is relevant to consider whether an individual's educational background influences their responses on the EBI. Schommer (1993b) found that junior college students were more likely to believe in simple and certain knowledge and quick

learning than university students. Future research on the EBI is needed to aid in the development of the theoretical understanding of epistemic beliefs (Schraw et al., 2002).

Concluding Remarks

The students and faculty members who participated in this study reminded me of why I am drawn to the study of higher education. They offered insightful, thoughtful responses to questions about their teaching and learning experiences and I, in return, learned from them. Students appeared as individuals interested in their education and despite a misconception of some who work in higher education that students do not give much thought about their academic experiences; these students had important things to say about knowledge, knowing, and their academic life. In addition, the faculty were seen as concerned individuals with a desire to get through to students and encourage them to become involved in their education. I hope that further work in the area of epistemological congruency will have a positive effect on the college classroom resulting in learning environments that foster diversity of thought and life long learning.

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APPENDIX A
EPISTEMOLOGICAL BELIEFS INVENTORY (EBI)

Please indicate how strongly you agree or disagree with each of the statements listed below. Please circle the number that best corresponds to the strength of your belief.

1. It bothers me when instructors don't tell students the answers to complicated problems.

Strongly Disagree	1	2	3	4	5	Strongly Agree

2. Truth means different things to different people.

Strongly Disagree	1	2	3	4	5	Strongly Agree

3. Students who learn things quickly are the most successful.

Strongly Disagree	1	2	3	4	5	Strongly Agree

4. People should always obey the law.

Strongly Disagree	1	2	3	4	5	Strongly Agree

5. Some people will never be smart no matter how hard they work.

Strongly Disagree	1	2	3	4	5	Strongly Agree

6. Absolute moral truth does <u>not</u> exist.

Strongly Disagree	1	2	3	4	5	Strongly Agree

7. Parents should teach their children all there is to know about life.

Strongly Disagree	1	2	3	4	5	Strongly Agree

8. Really smart students don't have to work as hard to do well in school.

Strongly Disagree	1	2	3	4	5	Strongly Agree

9. If a person tries too hard to understand a problem, they will most likely end up being confused.

Strongly Disagree	1	2	3	4	5	Strongly Agree

10. Too many theories just complicate things.

Strongly Disagree	1	2	3	4	5	Strongly Agree

11. The best ideas are often the most simple.

Strongly Disagree	1	2	3	4	5	Strongly Agree

12. People can't do too much about how smart they are.

Strongly Disagree	1	2	3	4	5	Strongly Agree

13. Instructors should focus on facts instead of theories.

Strongly Disagree	1	2	3	4	5	Strongly Agree

14. I like teachers who present several competing theories and let their students decide which is best.

Strongly Disagree	1	2	3	4	5	Strongly Agree

15. How well you do in school depends on how smart you are.

Strongly Disagree	1	2	3	4	5	Strongly Agree

16. If you don't learn something quickly, you won't ever learn it.

Strongly Disagree	1	2	3	4	5	Strongly Agree

17. Some people just have a knack for learning and others don't.

Strongly Disagree	1	2	3	4	5	Strongly Agree

18. Things are simpler than most professors would have you believe.

Strongly Disagree	1	2	3	4	5	Strongly Agree

19. If two people are arguing about something, at least one of them must be wrong.

Strongly Disagree	1	2	3	4	5	Strongly Agree

20. Children should be allowed to question their parents' authority.

Strongly Disagree	1	2	3	4	5	Strongly Agree

21. If you haven't understood a chapter the first time through, going back over it won't help.

Strongly Disagree	1	2	3	4	5	Strongly Agree

22. Science is easy to understand because it contains so many facts.

Strongly Disagree	1	2	3	4	5	Strongly Agree

23. The moral rules I live by apply to everyone.

Strongly Disagree	1	2	3	4	5	Strongly Agree

24. The more you know about a topic, the more there is to know.

Strongly Disagree	1	2	3	4	5	Strongly Agree

25. What is true today will be true tomorrow.

Strongly Disagree	1	2	3	4	5	Strongly Agree

26. Smart people are born that way.

Strongly Disagree	1	2	3	4	5	Strongly Agree

27. When someone in authority tells me what to do, I usually do it.

Strongly Disagree	1	2	3	4	5	Strongly Agree

28. People who question authority are trouble makers.

Strongly Disagree	1	2	3	4	5	Strongly Agree

29. Working on a problem with no quick solution is a waste of time.

Strongly Disagree	1	2	3	4	5	Strongly Agree

30. You can study something for years and still not really understand it.

Strongly Disagree	1	2	3	4	5	Strongly Agree

31. Sometimes there are no right answers to life's big problems.

Strongly Disagree	1	2	3	4	5	Strongly Agree

32. Some people are born with special gifts and talents.

Strongly Disagree	1	2	3	4	5	Strongly Agree

APPENDIX B
STUDENT INTERVIEW PROTOCOL PILOT

What do you think of your instructor as a teacher?

What do they do (both in and outside of class) that is helpful to your learning?

Are there things you wished that the instructor would do to better assist you in your learning?

College is a time that you will be introduced to many ideas and types of knowledge. How do you think they fit together? In other words, in your view are ideas from different areas usually connected or are they pretty separated?

Does knowledge stay the same or is it always changing?

What are the main sources of knowledge for you? How do you know when something is true?

Does it help in your learning if you study a particular topic over time or do you figure, if you don't understand it from the beginning, you probably won't?

Do you think it's possible to improve your learning ability with practice over time? Why or why not?

If every class you took were like this one, how likely do you think it is that you would remain in school?

APPENDIX C
CONSENT FORM

1. Title of Research Study: Epistemological Congruency in Community College Classrooms: Effects of Epistemological Beliefs on Students' Experiences

2. Performance Site: [Cypress College]
[Southeastern United States]

3. Investigators: The following investigators are available for questions about this study, M-F, 8:00 a.m. to 4:00 p.m.

Dr. Becky Ropers-Huilman (225) 578-2892
Cheryl Fruge' (337) 264-1549

4. Purpose of the Study:
This purpose of this research project is to explore whether or not the congruency of epistemological beliefs between faculty and students is related to students' grades, academic integration, and intentions to persist in college. If related, what is the nature of the relationship?

5. Subject Inclusion: Community College Students and Faculty

6. Number of subjects: 40

7. Study Procedures: This study will be conducted in two phases. In the first phase, all students and their instructor in [a liberal arts course] will complete the Epistemological Beliefs Inventory (EBI). This inventory will take approximately 10 minutes. Students will also complete a Demographics Survey. In the second phase, eight participants will be chosen based on their responses to the inventory for interviews on two occasions. Interviews will be scheduled with the student and will take approximately 1 hour. Interviews will be tape recorded and transcribed. Students will also be observed in class on two occasions. The liberal arts instructor and 5-9 other instructors will also be chosen for EBI completion and interviews. These interviews will be tape recorded and transcribed.

8. Benefits: It is hoped that the data collected will provide insight into teaching and learning practices of instructors and students. If chosen for the interview, students will be receive a gift card to thank them for their time.

9. Risks: Every effort will be made to maintain the confidentiality of your responses. Files will be kept in secure cabinets to which only the investigator has access. As such, there are no known risks to this study.

10. Right to Refuse: Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. Privacy: Results of the study may be published, but no names or identifying information

will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

12. Signatures: The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

_____	_____	_____
Signature	Name (please print)	Date

APPENDIX D
DEMOGRAPHIC SURVEY

Age: 16-18____ 19-21____ 22-25_____ 26-30____ 30-39_____ 40-49_____
50-59_____ 60+_____

Gender: Female____ Male____

Race: African American_____ Caucasian_____ Hispanic_____ Native American_____
Asian_____Other (write in)_____

Marital Status: Single_____ Married_____ Other_____

Do you have children? Yes_____ No_____

High School G.P.A. (on a four point scale): 2.0-2.25____ 2.26-2.50____
2.51-3.0____ 3.10-3.50____ 3.6-4.0____

College G.P.A. (on a four point scale): 2.0-2.25____ 2.26-2.50____
2.51-3.0____ 3.10-3.50____ 3.6-4.0____

Semester in attendance at SLCC:
First ____ Second____ Third_____ Fourth_____ Fifth or greater_____

Did you attend a university prior to attending the community college? Yes____ No____
If yes, how long?_____

What is the highest level of education obtained by your parents?
(Answer one for each parent)

	Father Or Male Guardian	Mother or Female Guardian
less than high school diploma	( )	( )
graduated from high school but did not go any further	( )	( )
went to vocational, trade, or business school	( )	( )
attended college, but did not earn degree	( )	( )
earned an associate's degree	( )	( )
earned a bachelor's degree	( )	( )
attended graduate school	( )	( )
earned a master's degree	( )	( )
earned a doctorate degree	( )	( )

Your reasons for attending the community college: (check all that apply)

____Cheaper cost than university
____Closer to my home
____Smaller classes
____Smaller campus
____Struggled academically at a four-year institution
____Open admissions policy at this college
____Other, please list_____

Your academic goals:
____Plan to obtain an associate's degree
____Plan to obtain an associate's degree and then transfer to a four-year university
____Plan to take a few courses and then transfer to a university
____Taking courses for self-improvement or job-related requirements but no plans to obtain a degree

I plan to attend this college next semester:
____Yes ____No

APPENDIX E
STUDENT INTERVIEW PROTOCOL

What do you think of your instructor as a teacher?

What do they do (both in and outside of class) that is helpful to your learning?

Are there things you wished that the instructor would do to better assist you in your learning?

College is a time that you will be introduced to many ideas and types of knowledge. How do you think they fit together? In other words, in your view are ideas from different areas usually connected or are they pretty separated?

Does knowledge stay the same or is it always changing?

What are the main sources of knowledge for you? How do you know when something is true?

Does it help in your learning if you study a particular topic over time or do you figure, if you don't understand it from the beginning, you probably won't?

Do you think it's possible to improve your learning ability with practice over time? Why or why not?

If every class you took were like this one, how likely do you think it is that you would remain in school?

Tell me about a time when you were “in sync” with your instructor.

Tell me about a time when you were “out of sync” with your instructor.

APPENDIX F
SECOND STUDENT INTERVIEW PROTOCOL

How would you describe your relationships with faculty inside the classroom?

How have these relationships influenced your personal growth, values, and attitudes?

What types of opportunities are available at this school for interacting with faculty?

How would you describe your instructors' attitudes about teaching, student's intellectual growth and well-being?

Describe your academic experiences so far this semester. Are your classes stimulating, boring or somewhere in the middle. To what do you attribute your experiences?

How have your academic experiences influenced your academic growth or interest in ideas and intellectual matters?

Adapted from:

Pascarella, E. T. & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *The Journal of Higher Education, 51*(1), 60-75.

APPENDIX G
FACULTY INTERVIEW PROTOCOL

In your view are ideas from different areas/disciplines usually connected or are they pretty separated?

Does knowledge stay the same or is it always changing?

What are the main sources of knowledge for you? How do you know when something is true?

Does it help in your learning if you study a particular topic over time or do you figure, if you don't understand it from the beginning, you probably won't?

Do you think it's possible to improve your learning ability with practice over time? Why or why not?

*After each question, discuss how this belief may or may not relate to various classroom practices such as preferred teaching style, assignments and methods of assessment.

APPENDIX H
OBSERVATIONAL PROTOCOL

How does epistemological congruence (EC) affect student experience?

7. What is the relationship between EC and students' grades?
8. What is the relationship between EC and students' academic integration?
9. What is the relationship between EC and students' intentions to persist?

Teacher Activities	Student Activities	My Notes/Codes/ Themes

VITA

Cheryl Fruge was born in Joliet, Illinois, in 1967 where she lived until her family moved to Baton Rouge, Louisiana, in 1975. She graduated from the public school system in 1985 and began her career in higher education at Louisiana State University at Baton Rouge. In 1989, she graduated from LSU with a Bachelor of Science degree in psychology. In 1991, she obtained her Master of Arts degree in agency counseling, also from LSU. Shortly after graduation, she took a position at Louisiana State University at Eunice in Student Support Services.

From 1993 to 1998, Fruge worked in the private vocational rehabilitation field. In 1998, she was able to return to the setting of which she was most fond – higher education. She worked for the community and technical college system as an advisor/counselor from 1998 to 2004. Due to her interest in and appreciation of higher education, she enrolled in the doctoral program of Educational Leadership, Research and Counseling with an emphasis in higher education administration where she was awarded a graduate assistantship. She is currently employed with a high school as the college coordinator.